

**Management**

# **Army Management of the Electromagnetic Spectrum**

**Headquarters  
Department of the Army  
Washington, DC  
1 October 1997**

**UNCLASSIFIED**

# ***SUMMARY of CHANGE***

AR 5-12

Army Management of the Electromagnetic Spectrum

This regulation--

- o Revises AR 5-12 and consolidates AR 105-3, AR 105-4, AR 105-24, and AR 105-28.
- o Revises Army Spectrum Management Policy (Chapter 1).
- o Revises Major Army Commands Spectrum Management Responsibilities (Chapter 2).
- o Outlines the Army's Electromagnetic Compatibility, Deconfliction, and Interference Programs (Chapter 3).
- o Outlines the Frequency Allocation-to-Equipment Process (Chapter 4).
- o Defines the spectrum coordination channels, spectrum assignment policy, and types of spectrum actions (Chapter 5).
- o Outlines the Radio Stations Identification procedures for the allocation of international call signs and call sign assignment authority (Chapter 6).
- o Outlines the Army's Interference Resolution Program (Appendix C).

Effective 1 November 1997

Management

## Army Management of the Electromagnetic Spectrum



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Secretary of the Army

**History.** This printing publishes a revision of this publication. Because the publication has been extensively revised, the changed portions have not been highlighted.

**Summary.** This revision updates and consolidates several regulations regarding policies and responsibilities for Army management of the electromagnetic spectrum. It covers the coordination and integration of the research, development, test, acquisition, fielding and operation of Army

materiel requiring frequency spectrum support. It also describes the Army spectrum management functional processes necessary to implement the National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management and the provisions of Department of Defense Directive (DoDD) 4650.1.

**Applicability.** This regulation applies to all active Army, the Army National Guard of the United States, and the US Army Reserves. It also applies to Army components of Unified Commands if it does not contradict guidance issued by the Unified Commands.

**Proponent and exception authority.** The proponent of this regulation is the Director, Information Systems for Command, Control, Communications, and Computers. The proponent has the authority to approve exceptions to this regulation that are consistent with law or regulation. Proponents may delegate the approval authority, in writing, to a division chief within the proponent agency in the grade of colonel or the civilian equivalent.

**Army management control process.**

This regulation contains management control provisions in accordance with AR 11-2 and contains checklists for conducting management control reviews.

**Supplementation.** US Army Major Command Supplements to this regulation that implement and/or delegate responsibilities to subordinate commands will be submitted for approval to HQDA (SAIS-PAS-M), Washington, DC 20310-0107.

**Suggested improvements.** Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to HQDA (SAIS-PAS-M), Washington, DC 20310-0107.

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\*This regulation supersedes AR 5-12, 15 May 1983, and rescinds AR 105-3, 31 July 1986; AR 105-4, 22 September 1977; AR 105-24, 28 March 1977; and AR 105-28, 25 July 1973.

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## Glossary

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## Chapter 1 Introduction

### 1-1. Purpose

This regulation:

*a.* Issues Army policy and assigns responsibilities for Army management of the electromagnetic spectrum (hereafter referred to as "spectrum management.")

*b.* Issues Army policy and assigns responsibilities for Army participation in service, joint, national, and international spectrum management activities.

*c.* Issues policies and responsibilities for spectrum allocations, allotments, and assignments by Army commands, agencies and activities within the United States and Possessions (US&P).

*d.* Issues guidance for spectrum allocations, allotments, and assignments to Army components of Unified commands.

*e.* Issues guidance for implementing spectrum management functions contained in AR 25-1, The Army Information Resources Management Program.

*f.* Issues policies and responsibilities for submitting US Army requirements for a DD Form 1494 (Application for Equipment Frequency Allocation) as outlined in Chapter 4.

*g.* Prescribes duties and responsibilities for Army commanders at all levels and for users at installation and unit levels who perform spectrum management duties.

*h.* Issues policy and responsibilities for achieving the Army spectrum-dependent electromagnetic environmental effects (E<sup>3</sup>) and electromagnetic compatibility (EMC) objectives during the design, development, acquisition, and use of spectrum-dependent equipment.

*i.* Issues policies, guidance, and responsibilities for the implementation and reporting of interference under the Army Interference Resolution Program (AIRP).

*j.* Issues policy for Army radio station identification.

### 1-2. References

Required and related publications and prescribed forms are listed in Appendix A.

### 1-3. Abbreviations and terms

Abbreviations and special terms used in this regulation are explained in the glossary.

### 1-4. Responsibilities

Responsibilities are listed in Chapter 2.

### 1-5. Goals

The goals of the Army spectrum management program for efficient use of the spectrum are:

*a.* To develop and efficiently manage Army use of the spectrum during the allocation, allotment, and assignment processes and thereby minimize the potential for interference during the fielding and employment of spectrum dependent equipment.

*b.* To obtain and manage the frequency resources to support Information Mission (IM) responsibilities, activities, and programs relating to the disciplines of telecommunications, automation, visual information, records management, and publications and printing.

*c.* To provide spectrum signal characterization, measurement, and enforcement procedures for continued operation in the Army, joint and combined environment.

### 1-6. Management of the electromagnetic spectrum

The Army's management of the spectrum is accomplished in the following terms:

*a. Allocation.* An allocation is the designation of frequency bands for use in performing specific functions or services. Allocations are made to communications services such as fixed, mobile, broadcast, and amateur. This process is not to be confused with the Army J/F-12 (Frequency Allocation-to-Equipment) process (permission to build or buy equipment for use in a particular frequency band) outlined in Chapter 4.

*b. Allotment.* An allotment is the designation of specific frequency bands or groups of frequencies within a prescribed allocation.

*c. Assignment.* An assignment is the designation of a specific frequency or frequencies for use by a radio station under specified conditions. An assignment grants permission to operate or turn on authorized equipment.

*d. Enforcement.* Enforcement is the process of identifying and eliminating unauthorized use of the frequency spectrum with potentially punitive measures.

### 1-7. Management of the electromagnetic spectrum in the IM environment

AR 25-1, The Army Information Resources Management Program, identified three IM environments in which the Army spectrum management processes will be performed. The three environments are:

*a. Theater/Tactical.* This environment is defined as the operational Army Theater "area of operations." Types of information resources managed in this environment are those needed to direct, coordinate, and support deployable combat, combat support, and combat service support forces. The boundary of this environment extends from the tactical area of interest of the forwardmost deployed forces back to the Theater Army rear boundary, and includes the headquarters of joint, unified, or combined commands.

*b. Sustaining Base.* This environment encompasses area and information resources usually located outside the "area of operations." The environment encompasses the information resources and activities which have the responsibility to raise, organize, train, equip, and eventually, deploy and sustain Army and other assigned forces into the operational theaters - the Theater/Tactical environment. The types of information resources managed in this environment cover all functional areas other than those needed to actually direct tactical forces in the execution of their operational missions in the Theater/Tactical environment. The boundary of this environment is usually geographically located in the continental United States (CONUS) but, during peace and transition to conflict, extensions of the Sustaining Base may be found in the geographical operational area of the Theater/Tactical environment.

*c. Strategic Environment.* This environment pertains specifically to the type of information resources that support decision making during a national crisis. The type of information used is usually that which is concerned with large unit readiness and deployability status (time phased force deployment data (TPFDD), ports and strategic movement capabilities, strategic intelligence, and strategic contingency plans and deployment schedules. Headquarters Department of the Army (HQDA) agencies, major Army commands (MACOMs), and the Army components of deployed Army forces are major users and providers of this type of information.

### 1-8. Policies

The following policies address some of the major technological and operational requirements that must be met to achieve the Army's spectrum management goals:

*a.* The Army satisfies its spectrum resource requirements based on priority of operational needs. The Army satisfies these requirements by following the Army's Spectrum Management Master Plan (ASM2P), using operations plans contingency plans, TPFDD, and using computerized techniques, databases, and assignment systems.

*b.* Policies and guidelines for use of the spectrum by all Federal Government agencies have been established in the National Telecommunications and Information Administration (NTIA) Manual and provisions of DoDD 4650.1. The Army is obligated to comply with these policies unless waived by the Army Spectrum Manager.

*c.* Funds for the acquisition, research, development, production, purchase, lease, or use of weapons systems, information management systems or electronic warfare (EW) systems or other systems that require use of the electromagnetic spectrum will not be released by the obligating authority until a DD Form 1494 (Application for Frequency Allocation) has been approved. Sources of funding that are subject to the DD Form 1494 approval process are DoDR

5000.2-R, AR 25-3, and AR 70-1 acquisitions as well as Commander in Chief (CINC) initiative funds. The approval authority for DD Form 1494 within the Army is the Army Spectrum Manager (SAIS-PAS-M). Waivers may be obtained from the Army Spectrum Management Office. See Chapter 4 of this regulation.

*d.* Army materiel, which depends on or affects the use of the electromagnetic spectrum, will be introduced in the Army only after the results of EMC analyses have shown the proposed materiel is compatible with the intended electromagnetic environment and can be supported in its intended spectrum environment. Electronic Attack (EA) equipment is not usually required to be compatible with the electromagnetic environment. However, EA equipment developers must comply with the certification process (outlined in Chapter 4).

*e.* Spectrum resources allotted to Army installations or combat training center will be controlled by the garrison commander.

*f.* Requirements for the use of national and international spectrum resources will be consolidated at the US Army Communications-Electronics Services Office (USACESO).

*g.* For host nations, unified and joint commanders will coordinate and obtain authorizations to use spectrum resources with the host government. Diplomatic channels or established spectrum management channels will be used to obtain the authorizations required.

*h.* The Army spectrum management process must be responsive to the Army Command and Control System (ACCS). The ASM2P will be based upon the ACCS.

*i.* The Army Spectrum Manager is the principal negotiator for Army international spectrum management discussions, either through the Department of State on a Government-to-Government level; through "Status of Forces Agreements" already in force with host governments; or through the International Telecommunication Union (ITU) structure or meetings.

*j.* The Army Spectrum Manager is responsible for designating individuals or agencies to represent the Army spectrum management interests at the national level. Persons or agencies outside of the HQDA presenting a unilateral Army position, plan, purpose, or objective involving the electromagnetic spectrum must ensure that the position is coordinated with the Army Spectrum Manager prior to release.

*k.* No agency of the Army is authorized participation in Federal Communication Commission (FCC) legislative matters except as authorized by the Army Spectrum Manager.

*l.* The Army Spectrum Manager has designated the USACESO to be responsible for Army representation to the Radio Technical Commission for Aeronautics; the Radio Technical Commission for Maritime Services; the US Military Communications-Electronics Board (USMCEB); the Interdepartmental Radio Advisory Committee (IRAC); and the US National Committee representative to the Radiocommunications Bureau (BR). The Army Spectrum Manager may request specific commands or activities to provide representation to Army specific working parties, ad hoc groups/committees, or panels; however, the oversight and direction are the responsibility of the Army Spectrum Manager. Army participation in national and international spectrum management organizations is shown in Table 1-1.

*m.* The Army Spectrum Manager coordinates Army positions in cases of Congressional actions that could result in the transfer, sale, auction, or removal of spectrum resources from the Government/Military to industry or the civil/private sector.

*n.* Due to the degree and complexity of coordination required for effective spectrum management, informal discussions and communications are authorized and encouraged.

**Table 1-1**  
**Army Participation in Spectrum Management Organizations**

Spectrum Management Organization	USACESO	AMC
1. FMG, RCC	M	—
2. J/FP, USMCEB	M	—
a. Allocations Working Group (J-12)	M	—
b. Electromagnetic Compatibility Working Group (J-208a)	M	—
c. Frequency Resource Record System Working Group (J-208b)	M	—
d. FRRS Automation Working Group (J-208f)	M	—
e. Space Frequency Matters Working Group (J-208i)	M	M
f. JTIDS Frequency Coordination Working Group (J-208j)	M	—
g. WRC Preparation Working Group (J-208w)	M	M
h. Spectrum Management Communications-Computer Systems Architecture Working Group (J-208z)	M	M
3. IRAC	M	—
a. FAS	M	—
b. SPS	M	M
c. TSC	M	M
d. ING	M	M
4. US BR National Committee	M	—
5. US BR Study Groups (US BR SGs)		
a. SG-1 (Spectrum Utilization)	M	M
b. SG-2 (Space Research & Radio Astronomy)	M	M
c. SG-4 (Fixed Satellites)	M	M
d. SG-5 (Propagation in Nonionized Media)	M	M
e. SG-6 (Ionosphere Propagation)	M	M
f. SG-7 (Standard Time & Frequency)	M	—
g. SG-8 (Mobile)	M	M
h. SG-9 (Fixed, LOS & Tropo)	M	—
i. SG-10 (Broadcasting, Sound)	M	—
j. SG-11 (Broadcasting, Television)	M	—
k. General and Specialized WRC and ITU sponsored international meetings	M	—

**Table 1-1**  
**Army Participation in Spectrum Management Organizations—Continued**

Spectrum Management Organization	USACESO	AMC
6. ABCA	M	M

M = member

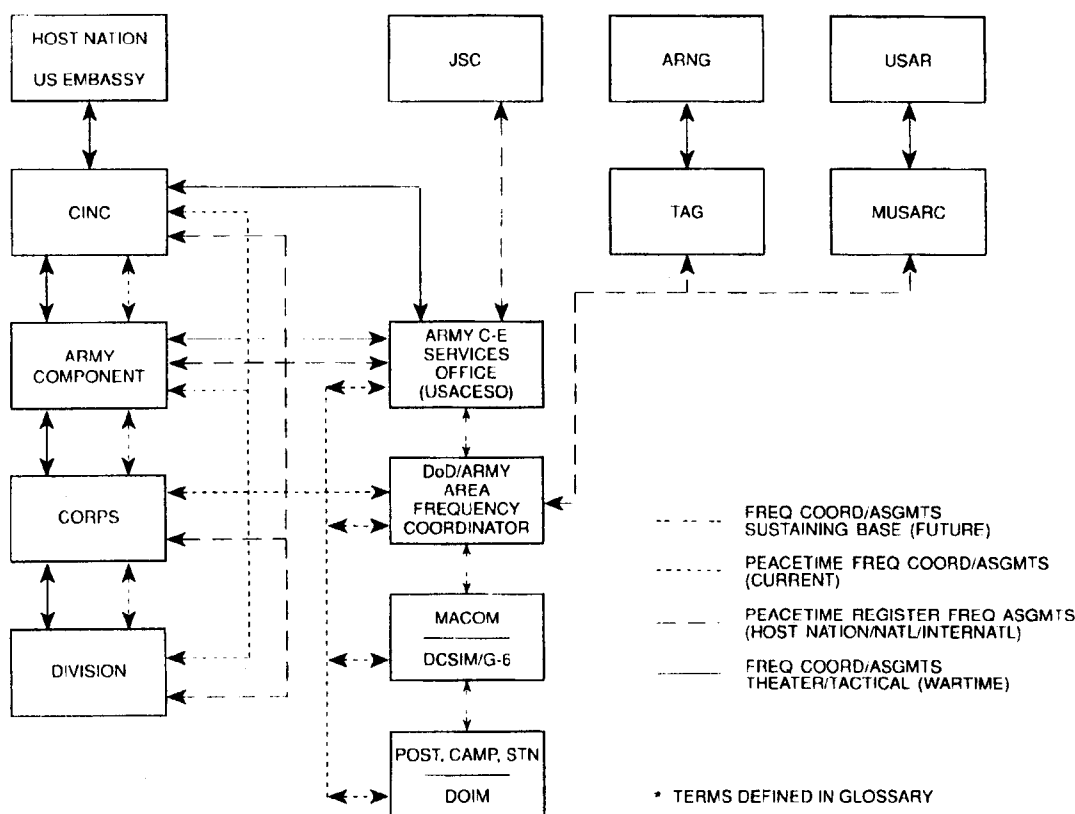
Terms defined in Glossary.

## Chapter 2 Responsibilities

### 2-1. Introduction

*a.* Various echelons within the Army have command and functional responsibilities for obtaining and managing systems and spectrum resources necessary to support the Army's requirements

discussed in Chapter 1. The commander or director of an organization is responsible for identifying and validating the spectrum requirements needed to accomplish the organization's assigned mission. Within a functional area, it is the functional proponent's responsibility to determine the information requirements needed to accomplish the functional mission. Figure 2-1 shows the functional Army spectrum management coordination channels along with spectrum management office designations.



**Figure 2-1. Army spectrum management functional coordination channels**

*b.* Support is provided through two channels of responsibility — command and staff channels and technical channels.

### 2-2. Command and staff channels

The commander or director of an organization, agency, or activity at all levels is responsible for—

*a.* Identifying, validating, and managing their spectrum requirements and resources in meeting the organization mission in accordance with Army policy, doctrine, and assigned responsibilities per this regulation.

*b.* Assuring that USMCEB spectrum guidance (Certification of Frequency Supportability) is received prior to contractual obligations to procure or develop equipment that radiates or receives electromagnetic energy in its intended environment.

*c.* Assuring that equipment directly procured or leased from commercial suppliers is acceptable for licensing by the FCC ("FCC type accepted").

*d.* Assuring that equipment procured under the exemption granted by the Army Spectrum Manager is FCC type accepted.

*e.* Implementing the policies of the Internal/Review and Audit

Compliance Program outlined in AR 11-7, and conducting internal management control using the procedures and checklists modeled after those contained in AR 11-2. An example of an internal/management control checklist is provided in Appendix D.

### 2-3. Technical channels

*a.* Organizations, activities, and individuals are assigned responsibility for performing technical research, development engineering, allocation, allotment, and assignment missions that support Army spectrum management. Spectrum management conducted within these technical channels will be conducted within the limits of established Army policy.

*b.* There is no strict hierarchy within the technical channels. Coordination of issues with one or many offices is expected to occur. Issues are to be resolved at the lowest possible level of

command. Issues that cannot be resolved within these channels are referred to command and staff channels for action.

### 2-4. Applicability

The responsibilities assigned by this regulation apply to all Active Army, Army National Guard, and US Army Reserve organizations organized under Tables of Organization and Equipment (TOE) and Tables of Distribution and Allowances (TDA).

### 2-5. Responsibilities

Responsibilities for Army spectrum management are outlined in this chapter and depicted in Figure 2-2.

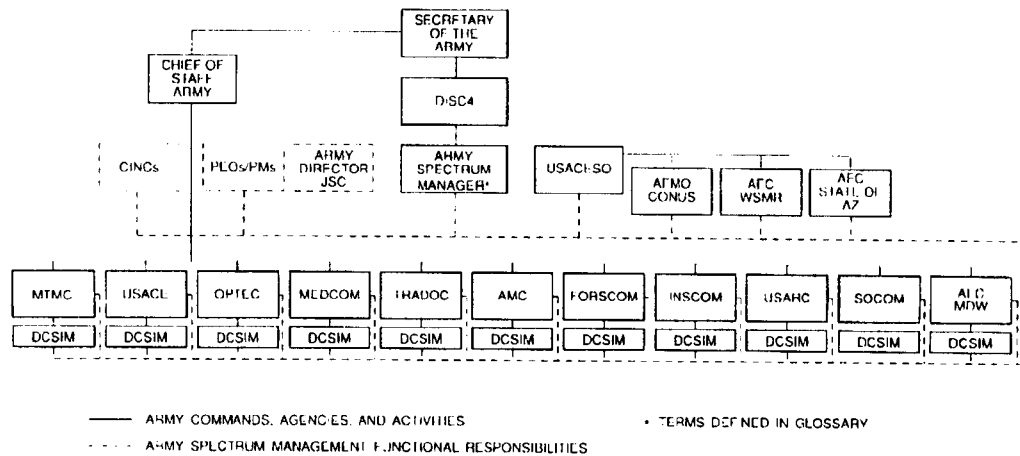


Figure 2-2. Army spectrum management organizations

### 2-6. Director of Information Systems for Command, Control, Communications, and Computers (DISC4)

The DISC4 will—

- Direct and provide oversight to the Army spectrum management program.
- Perform spectrum planning to satisfy Army warfighter requirements for spectrum resources during peacetime and wartime.
- Advise the Secretary of the Army as well as the Chief of Staff of the Army on spectrum matters.
- Support and defend resource requirements for spectrum management in the Army Planning, Programming, and Budgeting System (APPBS).
- Direct Army representation in the national and international spectrum regulatory process.
- Represent the Secretary of the Army for implementation of the Electromagnetic Compatibility Program per DoDD 3222.3.
- Advise the Assistant Secretary of the Army for Research, Development and Acquisition (ASA (RD&A)) on spectrum management considerations in acquisition strategies for weapon, command and control communication, intelligence, and information management systems per AR 70-1.
- Provide the Army Spectrum Manager.

### 2-7. The Army Spectrum Manager

The Army Spectrum Manager also serves as the Director of the USACESO. The Army Spectrum Manager will—

- Develop and promulgate Army spectrum policy and planning guidance in support of all Army spectrum management activities.

*b.* Implement responsive spectrum management processes to meet Army needs and requirements at both the national and international levels. This regulation authorizes the Army Spectrum Manager to review and update the Army spectrum management structure and assign specific functions within the Army as required.

*c.* Implement the Army Interference Resolution Program (AIRP) in accordance with the guidance contained in Chapter 3 and Appendix C of this regulation.

*d.* Coordinate spectrum management matters within the office of the Secretary of the Army (OSA) and the Army Staff (ARSTAF).

*e.* Identify, budget, and provide a direct fund line in the APPBS for Army-wide spectrum management/EMC initiatives, studies, and analyses program on a recurring FY basis.

*f.* Budget and provide a direct fund line for the operational EMC services implemented by the US Army Signal Command (USASC).

*g.* Budget and provide a direct fund line for the Army J/F-12 Program on a FY basis.

*h.* Represent the Secretary of the Army for DoD management and use of the spectrum per DoD Directive 4650.1, as required.

*i.* Manage and be the principal Army negotiator for Army international discussions, either through the US Department of State on a Government-to-Government level; through "Status of Forces" in cases of host government relationships; or for ITU structure or meetings.

*j.* Validate and approve all spectrum management databases and analysis capabilities developed for Army-wide use.



k. Oversee the Army spectrum management automation architecture to ensure compliance with DoD automation standardization initiatives.

l. Coordinate with the Deputy Chief of Staff for Personnel, for priority of assignment of personnel to critical spectrum management positions identified by the MACOMs.

m. Assist the commanders of MACOMs in defining and justifying requirements for TOE/TDA spectrum management positions at Army posts, camps, stations, and combat training centers.

n. Review Army materiel objectives and requirements to identify potential effects on the spectrum per AR 70-1 and AR 25-3.

o. Ensure Army spectrum management policies, plans, programs, and procedures are compatible with the life cycle management of Army materiel per DoD 5000 and 8000 series guidelines and governing regulations.

p. Serve as the central Army manager for processing and approval of Army DD Form 1494s prior to submission of the DD Form 1494 to the Joint Spectrum Center (JSC).

q. Represent spectrum management requirements in Army Systems Acquisition Review Councils per AR 15-14.

r. Provide the Army member to the IRAC and direct Army participation in IRAC activities.

s. Provide the Army member to the Radio Communications Bureau (BR) and direct Army participation in BR study groups.

t. Provide the Army member to the USMCEB Joint Frequency Panel.

u. Provide the Army member to the Combined Communications-Electronics Board (CCEB) Frequency Panel.

v. Prepare and publish the ASM2P.

w. Monitor the spectrum management and EMC support provided by the JSC to the ARSTAF, MACOMs, and Army commands, agencies and activities. Coordinate the assignment of the JSC/Army Director with the US Army Personnel Command, and the Commander, JSC.

x. Report and coordinate the resolution of serious electromagnetic interference (EMI) incidents with appropriate Army and other Service activities, to include the JSC Joint Spectrum Interference Resolution (JSIR) team, US civilian telecommunications organizations, and host nations, if required.

y. Provide ARSTAF supervision of the US Army Signal Operation Instructions (SOI)/Communications-Electronics Operation Instructions (CEOI) Program per AR 25-1.

z. Identify spectrum management and EMC requirements in the Army E3 Program.

## **2-8. US Army Communications-Electronics Services Office (USACESO)**

The USACESO is a field operating agency that assists the Army Spectrum Manager in managing the Army's spectrum management program. The USACESO performs unique and specialized operational IM functions at the direction of the Army Spectrum Manager. The USACESO will:

a. Serve as the focal point for the Army spectrum management program and perform assigned IM and spectrum management responsibilities as directed by the Army Spectrum Manager.

b. Communicate with the JSC, ARSTAF, other military services, MACOMs, other Government agencies, and activities in the private sector in the performance of assigned duties.

c. Command and exercise technical control over Army Frequency Management Office-CONUS (AFMO CONUS), Fort Sam Houston, TX; DoD AFC State of Arizona, Fort Huachuca, AZ (AFC-AZ); and DoD AFC White Sands Missile Range, White Sands, NM (AFC-WSMR).

d. Exercise technical control over the Army Frequency Coordinator, Military District of Washington (AFC-MDW), Fort Lesley J. McNair, Washington, DC; and Army Frequency Coordinator, USACE (AFC-USACE), Washington, DC.

e. Coordinate specialized spectrum management requirements with the USACE and the MDW. Coordinate specialized spectrum management requirements for the National Training Center (NTC)

at Fort Irwin, CA, and the Joint Readiness Training Center (JRTC) at Fort Polk, LA. Coordinate spectrum management requirements for the states of Hawaii and Alaska through the Commander, United States Army, Pacific (USARPAC).

f. Coordinate and obtain spectrum resources and make frequency allotments and/or assignments to Army operational requirements in the US&P.

g. Communicate directly with the Army Spectrum Manager for Army spectrum management policy and guidance on the allocation of Government spectrum resources to frequency-dependent equipment being procured or developed for Army use.

(1) Recommend to Program Executive Officers/Program Managers (PEOs/PMs), separate PMs, and others in the materiel development community the initiation of frequency supportability assessments before Requests for Frequency Allocation to Equipment (DD Form 1494) actions are submitted.

(2) Ensure that required EMC analyses are conducted before DD Forms 1494 are submitted.

(3) Ensure that the results of EMC analyses accompany each DD Form 1494.

(4) Ensure that the results of the EMC analysis describe the EMC of proposed system(s) with its coexisting electromagnetic environment.

h. Serve as the Army coordinator of Army test bed programs for emerging spectrum-dependent systems and models.

i. Implement international, national, Department of Defense (DoD), Joint, and HQDA spectrum management policy and guidance as directed by the Army Spectrum Manager.

j. Represent the Army on committees, groups, and organizations that address spectrum management issues when directed by the Army Spectrum Manager.

k. Provide the Army member on the Frequency Assignment Subcommittee (FAS), International Notification Group (ING), the Spectrum Planning Subcommittee (SPS) of the IRAC, and various ad hoc groups of the NTIA.

l. Provide members to the USMCEB Frequency Panel and coordinate Army participation in USMCEB working groups.

m. Provide the Army member to the USMCEB Frequency Panel.

n. Process requests for spectrum resources for Army commands and activities.

o. Review and provide comment on spectrum proposals of other Government and non-Government activities and foreign governments which impact on current and future Army interest.

p. Identify and provide the required Army support for processing, storing, and retrieving frequency assignment records in the DoD Frequency Resource Record System (FRRS).

q. Serve as Army focal point for entering data in the Government Master File (GMF) and the FRRS.

r. Provide spectrum resources to support Army components of unified commands as required.

s. In coordination with the US Army Training and Doctrine Command (TRADOC), identify requirements for E3, EMC/ spectrum management training, monitoring, and education.

t. Serve as the focal point for the AIRP for collecting and reporting all instances of interference in accordance with procedures outlined in Chapter 3 and Appendix C.

u. Coordinate spectrum management information and requirements for Major Automated Information Systems per AR 25-3.

## **2-9. MACOM commanders**

MACOM commanders will coordinate, plan, program, and fund for adequate management and supervision of the spectrum. Normally, the Deputy Chief of Staff for Information Management (DCSIM), a principal staff officer, will serve as the staff component for management and supervision of this finite resource. MACOM commanders will appoint a frequency spectrum coordinator for spectrum requirements for each Major Subordinate Command (MSC).

## **2-10. Major subordinate command (MSC) commanders**

MSC commanders will coordinate, plan, program, and fund for adequate management and supervision of the spectrum. Normally,

the Assistant Chief of Staff for Information Management/Signal Officer (ACSIM/SO) will be responsible for management of this finite resource.

## **2-11. US Army installations**

Installation commanders will coordinate, plan, program, and fund for adequate management and supervision of the spectrum. Installation commanders are responsible for all devices that emit electromagnetic radiations from their installation. Normally, Installation commanders will have a Director of Information Management (DOIM), as a principal staff officer, who is responsible for management of this finite resource. Where no fully resourced installation configuration exists, the owning MACOM will establish areas or regions and will designate an installation to provide information management support.

## **2-12. Major command DCSIM**

The MACOM DCSIM/G-6 will—

- a. Serve as the MACOM staff component for spectrum management.
- b. Coordinate the development of the MACOM information resources management program and supervise its implementation.
- c. Identify and validate requirements for authorized Spectrum Manager positions at the MACOM headquarters, adequate to discharge the functions.
- d. Identify and validate requirements for authorized Frequency Manager positions at the MSCs headquarters, adequate to discharge assigned functions.
- e. Identify and validate requirements for authorized Frequency Manager positions at CONUS-based MACOMs.
- f. Identify and validate requirements for authorized Frequency Manager positions at installations.
- g. Coordinate critical spectrum management personnel requirements internally with MACOM personnel and budgeting directorates and externally with the Army Spectrum Manager.
- h. Serve as the staff proponent for the MACOM EMC Program (EMCP) which includes developing and maintaining the EMCP, funding, and interfacing, as required, with HQDA and other Army agencies.
- i. Serve as MACOM staff proponent for the information management staff activities in the IM disciplines.
- j. Conduct MACOM headquarters oversight for spectrum resourcing and other spectrum management related activities at MACOM installations.
- k. Determine peace and wartime communications equipment, spectrum resources, and computer system requirements and obtain sufficient capabilities as appropriate.

## **2-13. MACOM Spectrum Manager**

The MACOM Spectrum Manager will—

- a. Manage the spectrum resources used by the MSCs, CONUSAs (as applicable), and installations.
- b. Consolidate requirements for spectrum resources and support during mobilization and deployment planning, training, operations, and contingencies.
- c. Coordinate requirements with the Army Spectrum Manager and the USACESO to determine spectrum supportability.
- d. Identify and validate identified requirements for spectrum resources.
- e. Plan, program, and budget for resources to satisfy the MACOM spectrum management program requirements per AR 1-1 and this regulation.
- f. Identify MACOM spectrum resource requirements in the development of information systems requirements per ARs 25-1 and 25-3.
- g. Assist the USACESO and other MACOMs in the development of spectrum management doctrine.
- h. Through coordination with the USACESO, identify, budget for, and enhance the procurement of approved automated EMC tools

for the assignment of spectrum resources, determine technical solutions for spectrum related problems and enforce adherence to specified technical assignment parameters.

- i. Prepare and provide MACOM spectrum management requirements for the ASM2P.
- j. Implement the AIRP throughout the MACOM.

## **2-14. Major Subordinate Component Command (MSCC) (Corps and CONUSAs) ACSIM/SO**

The MSCC ACSIM/SO will—

- a. Serve as the staff component for spectrum management.
- b. Coordinate the development of and implement the MSC Information Resources Management (IRM) program.
- c. Identify and validate requirements for spectrum management positions at the MSCC headquarters to the appropriate MACOM.
- d. Coordinate with the Deputy Chief of Staff for Personnel and the Comptroller to assure continuity of spectrum management. Coordinate with the MACOM DCSIM for critical shortages in spectrum management personnel.
- e. Serve as the staff proponent for the MSCC EMCP, include its development, maintenance, funding, and interfacing with the MACOM.

## **2-15. MSCC Spectrum Manager**

The MSCC Spectrum Manager will—

- a. Manage the spectrum resources used by the Commander.
- b. Serve as the single point of contact for the MSCC spectrum and call sign usage.
- c. Consolidate SOI information for generating SOIs for the MSCC using the Revised Battlefield Electronic CEOI System (RBECS).
- d. Serve as the consolidating, validating, and prioritizing office for requests for satellite service.
- e. Assemble necessary information and data for Integrated Satellite Data Base submissions to assure access on needed space platforms.
- f. Identify and validate MSCC spectrum requirements in operational, crisis, wartime, and contingency planning.
- g. Identify and validate MSCC spectrum requirements for exercises, deployments, employments, and peacetime operations.
- h. Coordinate requirements through the chain of command to obtain spectrum supportability.
- i. Provide experts knowledgeable of spectrum engineering and modeling systems for subordinate and attached units.
- j. Assist in the development of spectrum management doctrine.
- k. Obtain automated spectrum management, EMC assurance, SOI generation, and EW tools and systems sufficient to assure mission accomplishment.
- l. Ensure MSCC adherence to the spectrum resource processes.
- m. Obtain assets to enforce the MSCC's adherence to assigned spectrum resources.
- n. Review and update MSCC operations and contingency plans to reflect changes necessary to accomplish spectrum management.
- o. Present the MACOM Spectrum Manager with concerns and requirements that affect the ASM2P.
- p. Identify MSCC spectrum resource requirements in the development of information systems per ARs 25-1 and 25-3.
- q. Validate identified requirements for spectrum management.
- r. Prepare and provide MSCC input to the MACOM for inclusion in the ASM2P.

## **2-16. Army Garrison Commander**

The Garrison Commander will—

- a. Oversee the spectrum resources as related to the performance of the garrison mission.
- b. Support the Director of Information Management (DOIM) in the performance of its Information Management Authority.

## **2-17. Director of Information Management (DOIM)**

The DOIM will—

a. Serve as the Information Management Authority for the installation. This includes, but is not limited to:

- (1) Provide operational and training spectrum resources which are authorized for such use on the installation.
- (2) Process new requests for frequencies.
- (3) Educate the installation and tenant activities on Army spectrum management procedures, doctrine, and policy.
- (4) Perform limited technical analysis.
- (5) Report or resolve interference problems according to the AIRP as outlined in Chapter 3 and Appendix C.
- (6) Validate the installation information and functional area requirements necessary to accomplish the installation's assigned mission.

b. Through coordination with the installation commander, the MACOM DCSIM, and the USACESO, identify and forward to the installation resource manager budgeting requirements for procurement of Army-approved automated hardware and user-friendly software to perform base-level spectrum management and technical analysis functions (e.g., sustaining base information services software).

c. Determine peace and wartime communications equipment, spectrum resource, and computer system requirements and obtain sufficient capabilities as appropriate to the installation (e.g., increased mobilization and/or training base requirements).

d. Coordinate with other installation directorates to ensure that frequency-dependent equipment being developed or procured by or for use on the installation are fully spectrum supportable. See Chapter 4 of this regulation.

e. Assure that spectrum authorizations used within their areas of responsibility are valid. Such authorizations must be obtained per this regulation Chapters 4 and 5.

f. Ensure that garrison spectrum emitters operate within geographical and technical parameters to promote electromagnetic compatibility among equipment.

g. Serve as the point of contact for spectrum and non-tactical call sign requirements and usage within the installation, including tenant activities and units conducting training on the installation.

h. Keep records on the types of equipment, locations of equipment, and use of the spectrum and non-tactical call signs assigned to the installation.

i. Process and forward requests for spectrum and call sign assignment, which cannot be met from authorized resources, to the supporting AFC.

j. Review all spectrum assignments at least every five years or sooner, as required in Paragraph 5-3f.

k. Program, budget, and coordinate with the Installation Commander and appropriate directorates for financial resources for executing assigned spectrum management responsibilities per AR 1-1 and this regulation.

l. Perform other duties as assigned by AR 25-1.

## **2-18. Commanding General, US Army TRADOC (CG, TRADOC)**

The CG, TRADOC will—

a. Implement spectrum requirements in all combat development responsibilities to include:

(1) Conducting initial spectrum supportability assessments in the analysis of identified threats and operational capability goals.

(2) Identifying spectrum analysis needs for evaluating technical concepts.

(3) Coordinating spectrum requirements in all Operational Readiness Documents with the Army Spectrum Manager per DoD 5000.2.

b. Ensure spectrum resource requirements are incorporated in the development of information management direction and guidance as doctrine for the Strategic, Theater/Tactical, and Sustaining Base environments.

c. Prepare the TRADOC input to the ASM2P.

d. Program, budget, and provide financial resources to support assigned TRADOC spectrum management responsibilities per AR 1-1 and this regulation.

e. Participate in the preparation of spectrum management portions of IM regulations at the request of the Army Spectrum Manager.

f. Review TRADOC personnel authorization documents to ensure requirements for authorized spectrum management positions are identified for all TRADOC garrisons, installations, and organic organizations. Where necessary, justify and obtain authorized spectrum management spaces. Coordinate critical spectrum management personnel vacancies with the Army Spectrum Manager.

g. Perform spectrum management responsibilities as requested by the Army Spectrum Manager.

h. Implement the AIRP throughout TRADOC.

i. Provide certification information for all proposed or conceptual developments that will impact on the electromagnetic spectrum.

j. Provide for E3, EMC/spectrum management training, monitoring, and education at all TRADOC schools.

## **2-19. Commanding General, US AMC (CG, AMC)**

The CG, AMC will—

a. Provide E3 life cycle management guidance to Army materiel developers for research, development, acquisition, and product improvement to ensure system compatibility as outlined in Chapter 3.

b. Develop and provide automated tools to assist Army materiel developers in performing E3 assessments.

c. Develop spectrum engineering techniques and perform spectrum studies for developing and evolving Army systems and equipment developed by the MACOM and all subordinate commands.

d. Appoint a frequency spectrum coordinator for frequency spectrum matters, for IM and frequency spectrum requirements for each MSC.

e. Identify spectrum requirements in Outline Development Plans (ODPs).

f. Provide spectrum management support plans for all Army systems that impact on the spectrum resource.

g. Provide cost and operational equipment analysis (COEA) data to the Commander, TRADOC, as required.

h. Fulfill spectrum management responsibilities during research, development, and acquisition (RD&A) of Army materiel as directed by AR 70-1.

i. Prepare and forward the AMC input to the ASM2P.

j. Direct the AMC MSCs coordinators to interface with the USACESO and the Army Spectrum Manager, as required.

k. Program, budget, and provide resources to support assigned spectrum management responsibilities per AR 1-1 and this regulation.

l. Review AMC personnel authorization documents to identify requirements for authorized spectrum management positions at AMC installations and organizations. Where necessary, justify and obtain authorized spectrum management spaces and the qualified personnel to fill spectrum management requirements. Coordinate critical AMC spectrum management vacancies with the Army Spectrum Manager.

m. Implement the AIRP throughout AMC.

n. Perform spectrum management requirements as requested by the Army Spectrum Manager.

## **2-20. Commanding General, US Army Forces Command (CG, FORSCOM)**

The CG, FORSCOM will—

a. Identify the exercise Executive Agent to coordinate the spectrum resource requirements with the USACESO for Army contingency planning, field training exercises, and command post exercises.

b. Identify the exercise Executive Agent to coordinate the spectrum resource requirements with the USACESO for Army component use in joint contingency planning and operations, field training, and command post exercises.

c. Implement and integrate Army spectrum management doctrine, policy, and procedures to support Army and joint contingencies, field training exercises, and command post exercises in peacetime and wartime.

d. When requested by the Army Spectrum Manager, represent the Army on national and international spectrum management panels that affect the active Army, ARNGUS, and USAR to ensure total force representation is present as agreements (e.g., Standardization Agreements (STANAGs), Quadripartite Standardizations Agreements (QSTAGs)) are developed.

e. Apply spectrum management training criteria and doctrine to the total force.

f. Implement total force spectrum management training. Provide recommended instructional changes to Army doctrine, procedures, and training to the USACESO and the Army Spectrum Manager.

g. Maintain spectrum management readiness posture for the command.

h. Program, budget, and provide resources to support assigned FORSCOM, and its subelements, spectrum management responsibilities per AR 1-1 and this regulation.

i. Prepare the FORSCOM input to the ASM2P.

j. Review FORSCOM personnel authorization documents to identify requirements for authorized spectrum management positions at all FORSCOM installations and organizations. Where necessary, justify and obtain authorized spectrum management spaces and the qualified personnel to fill spectrum management requirements. Coordinate critical FORSCOM spectrum management vacancies with the Army Spectrum Manager.

k. Perform direct technical and staff support as requested by the Army Spectrum Manager.

l. Implement the AIRP throughout FORSCOM.

m. Maintain the updated RBECS SOI/CEOI/JCEOI database requirement for all CONUS based forces.

## **2-21. Commanding General, US Army Reserve Command (CG, USARC)**

The CG, USARC will—

a. Fulfill spectrum requirements in all Army Reserve responsibilities to include:

(1) Maintaining the technical proficiency and expertise of assigned spectrum managers.

(2) Identifying spectrum resource requirements in Mobilization Plans.

b. Coordinate spectrum requirements for Army Reserve installations and organizations.

c. Coordinate EMC analysis requirements with the Army Spectrum Manager.

d. Provide spectrum support plans for all Army Reserve operations that impact on the spectrum.

e. Prepare and forward, through the chain of command, the USARC portion of the ASM2P.

f. Program, budget, and provide resources to support assigned spectrum management responsibilities per AR 1-1 and this regulation.

g. Review personnel authorization documents to identify requirements for spectrum managers at USARC installations and organizations.

h. Justify and obtain spectrum manager positions to fulfill mission and function requirements. Coordinate critical spectrum manager personnel vacancies with the Army Spectrum Manager.

i. Perform spectrum management requirements as requested by the Army Spectrum Manager.

j. Implement the AIRP throughout USARC.

## **2-22. Commanding General, US Army Intelligence and Security Command (CG, INSCOM)**

The CG, INSCOM will—

a. Assist the CG, TRADOC in Army spectrum management training to support INSCOM requirements.

b. Program, budget, and provide for resources for executing assigned spectrum management responsibilities per AR 1-1 and this regulation.

c. Prepare the INSCOM spectrum management input to the ASM2P.

d. Participate in joint military, national, and international spectrum management activities as requested by the Army Spectrum Manager.

e. Coordinate and assist Army commands, agencies, and activities in fulfilling assigned spectrum management responsibilities related to the INSCOM mission and requirements.

f. Implement the AIRP throughout INSCOM.

## **2-23. Commanding General, US Army Signal Command (CG, ASC)**

The CG, ASC will—

a. Identify spectrum resource requirements to the Army Spectrum Manager in the development of information system requirements per AR 25-1 and AR 25-3.

b. Fulfill spectrum management responsibilities within the ASC mission for Army combat developments.

c. Perform spectrum planning and engineering for—

(1) Army air traffic control facilities through coordination with the Commander, US Army Aviation Center, Fort Rucker, AL and the USACESO.

(2) Portions of the Defense Communications System (DCS) assigned to the Army.

d. Prepare the USASC spectrum management input to the ASM2P.

e. Program, budget, and provide resources for executing ASC, and its subelements, spectrum management responsibilities per AR 1-1 and this regulation.

f. Review ASC personnel authorization documents to identify requirements for authorized spectrum management positions. Where necessary, justify and obtain authorization for spectrum management spaces and the qualified personnel to fill the spectrum management requirements. Coordinate critical personnel requirements with the Army Spectrum Manager.

g. Provide radio propagation technical services to the military services and other Government agencies per AR 10-87.

h. Perform field electromagnetic spectrum management and conduct electromagnetic radiation hazard (RADHAZ) surveys per ARs 10-87 and 5-50.

i. Program and obtain resources to engineer and operate mobile spectrum monitoring facilities to support Army spectrum management activities.

j. Perform direct technical and staff support as requested by the Army Spectrum Manager.

k. Implement the AIRP throughout ASC.

## **2-24. Commanding General, US Army Special Operations Command (SOC) (CG, USASOC)**

The CG, USASOC will—

a. Fulfill spectrum requirements in all Army Special Operations responsibilities to include:

(1) Identifying spectrum requirements in operations and contingency plans.

(2) Maintaining continuity of operations through judicious acquisition and use of the spectrum resource.

b. Coordinate spectrum requirements for Special Forces Groups/Teams/Organizations.

c. Coordinate EMC analysis requirements with the Army Spectrum Manager.

d. Provide spectrum support plans for all Army Special Operations that impact on the spectrum resource.

e. Prepare and forward, through the chain of command, the SOC portion of the ASM2P.

f. Program, budget, and provide resources to support assigned spectrum management responsibilities per AR 1-1 and this regulation.

g. Review personnel authorization documents to identify requirements for spectrum managers at SOC installations and organizations. Coordinate the filling of critical spectrum manager personnel positions with the Army Spectrum Manager.

h. Perform spectrum management requirements as requested by the Army Spectrum Manager.

- i. Implement the AIRP throughout SOC.

## **2-25. Commanding General, US Army Medical Command (CG, USAMEDCOM)**

The CG, USAMRMC will—

- a. Fulfill spectrum management responsibilities during RD&A of Army medical materiel as directed by The Surgeon General.
- b. Provide the Army Spectrum Manager with data concerning the location and electromagnetic characteristics of all Army medical materiel that either depends on, or affects the use of, the electromagnetic spectrum.
- c. Analyze and measure RADHAZ to personnel from all Army electromagnetic materiel per AR 40-46 and TB Med 523.
- d. Prepare the USAMEDCOM spectrum management input to the ASM2P.
- e. Program, budget, and provide resources for executing assigned USAMEDCOM spectrum management responsibilities per AR 1-1 and this regulation.
- f. Participate in joint military, national, and international spectrum management activities when requested by the Army Spectrum Manager.
- g. Coordinate operational management of spectrum resources peculiar to USAMEDCOM (e.g., X-rays, infrared).
- h. Implement the AIRP throughout the USAMEDCOM.

## **2-26. Commanding General, US Army Operational Test and Evaluation Command (CG, OPTEC)**

The CG, OPTEC will—

- a. Coordinate and conduct user testing and evaluation of spectrum-dependent Army materiel, tactical spectrum management systems, and spectrum management doctrine not otherwise assigned.
- b. Implement the AIRP throughout OPTEC.

## **2-27. Commanding General, US Army Space and Strategic Defense Command (CG, SSDC)**

The CG, SSDC will—

- a. Provide E3 life cycle management guidance to Army strategic and tactical missile defense and space developers for research, development, acquisition, and product improvement to ensure system compatibility as outlined in Chapter 3.
- b. Develop spectrum engineering techniques and perform spectrum studies for developing and evolving Army strategic and tactical missile defense and space systems and equipment developed by the MACOM and all subordinate commands.
- c. Coordinate spectrum requirements for SSDC installations and organizations.
- d. Coordinate EMC analysis requirements with the Army Spectrum Manager.
- e. Fulfill spectrum management responsibilities during research, development, and acquisition of Army strategic and tactical missile defense and space systems as directed by AR 70-1.
- f. Program, budget, and provide resources to support assigned spectrum management responsibilities per AR 1-1 and this regulation.
- g. Prepare the SSDC spectrum management input to the ASM2P.
- h. Participate in joint military, national, and international spectrum management activities as requested by the Army Spectrum Manager.
- i. Coordinate and assist Army commands, agencies, and activities in fulfilling assigned spectrum management responsibilities related to the SSDC mission and requirements.
- j. Implement the AIRP throughout SSDC.

## **2-28. Commanders of Reserve Component (RC) Units**

Commanders of RC units, i.e., ARNGUS and USAR, will—

- a. Submit applications for spectrum and call sign assignments to the AFC within whose area or jurisdiction the unit is located. A copy of the application will also be forwarded to the AFC in whose

area the frequencies and call signs will be employed. The coordination channels described below are for spectrum coordination purposes only. Actions which impact on command policies and directives will be forwarded through normal command channels. The spectrum coordination channels are:

(1) ARNGUS units will forward their requests through the State Adjutant General to the supporting AFC (Appendix B).

(2) USAR units will forward their requests through the Major USAR Command (MUSARC) to the Supporting AFC (Appendix B).

b. Normally, RC units are issued spectrum assignments for training in garrison or at specified training locations. If an RC unit conducts training at a new location, it must coordinate its spectrum requirements with the appropriate installation spectrum manager. Coordination must be completed at least 90 days prior to the conduct of the training, and information copies must be sent to the supporting AFC.

c. Assure that units conducting outside CONUS (OCONUS) training obtain spectrum resources from the sponsor unit through procedures outlined in command directives, exercise directives, or other appropriate documents.

d. Assure that spectrum resources for mobilization are obtained under the provisions of Commanding General, Forces Command policy and directives.

e. Implement the AIRP throughout the RC.

## **2-29. PEO/PM and Separate PM**

The PEO/PM will—

- a. Conduct technical research and engineering analyses to identify potential effects on the spectrum.
- b. Coordinate the resolution of critical or specialized spectrum management requirements/issues identified during the acquisition process with the Army Spectrum Manager.
- c. Ensure compliance with the policies and procedures for the Army Frequency Allocation to Equipment (Army J/F-12) Program as described in Chapter 4 by initiating the DD Form 1494.
- d. Provide resource funding for the conduct of spectrum supportability assessments and EMC analyses prior to and during the Life Cycle System Management Model (LCSMM) processes (refer to par 4-2).
- e. Integrate existing Army-approved EMC/spectrum hardware and software tools into system procurements whenever possible. Coordinate identification, potential use, and capabilities of existing hardware and software tools with the Army Spectrum Manager.
- f. Perform spectrum management requirements as identified by the Integrated Product Team.

## **2-30. Army Director, JSC**

The Army Director, JSC will—

- a. Represent the Army on the JSC staff and manage Army projects being performed by the Center.
- b. Provide liaison between the Army Spectrum Manager, the USACESO, and the Commander, JSC, to expedite coordination and actions requested by the Army Spectrum Manager.
- c. When requested by the Army Spectrum Manager, represent the Army at meetings concerning EMC, electromagnetic vulnerability (EMV), E3, EW, and spectrum management in the technical and functional areas of diagnostics and operational EMC analyses. Provide telephonic, written, and/or facsimile reports of the meetings to the Army Spectrum Manager.
- d. Provide spectrum management, EMC, EMV expertise to operational commanders, PEO/PMs, and spectrum managers.
- e. Provide technical assistance during the acquisition process, Test and Integration Working Groups (TIWGs), and other committees requested and approved by the Army Spectrum Manager.
- f. Provide reports on Army projects being performed by the Center and perform studies for the Army Spectrum Manager.
- g. At the request of CESO, advise PEO/PMs, combat developers, and system developers on the J/F-12 (Allocation of Frequency to Equipment) process and procedures for submission of DD Form

1494 (Application for Equipment Frequency Allocation), in cooperation with policies set forth by the Army Spectrum Manager.

*h.* Develop suitable computer hardware/software suites to adequately support Army operational requirements for spectrum management and EMC.

### **2-31. Special Frequency Responsibilities for Units, Organizations, and Activities**

Each unit, organization, or activity authorized to use frequencies will—

*a.* Assure that an authorization document for each spectrum resource used is retained by the operating activity.

*b.* Forward requests for renewal of temporary spectrum assignments at least 60 days prior to the expiration date.

*c.* Provide the information required by AR 380-5 for classified spectrum assignments.

*d.* Assure that the operation of communications-electronics (C-E<sup>3</sup>) equipment complies with the spectrum authorization limitations and tolerances.

*e.* Assure that current Army directives and procedural publications concerning spectrum management are available and being followed.

*f.* Review spectrum authorizations annually and identify those no longer required to the supporting AFC for deletion.

*g.* Identify to the supporting AFC or the USACESO the unit point of contact for all spectrum matters.

## **Chapter 3 Army Electromagnetic Compatibility, Deconfliction, and Interference Control Programs**

### **3-1. Introduction**

*a.* Since the primary spectrum management objective is efficient use of authorized spectrum resources, the effects of the electromagnetic environment must be considered when developing spectrum-dependent materiel.

*b.* As the spectrum becomes congested with more users, and as the spectrum is reallocated away from military use, the capability of equipment to operate without causing or experiencing unacceptable EMI becomes critical. The term used for the process of reducing EMI and thus optimizing the use of the spectrum for the spectrum management, intelligence and EW (IEW) communities is deconfliction.

*c.* The Army continues to assess measures for implementing the enforcement of proper spectrum use. Army users of the spectrum rely upon spectrum sharing agreements with other agencies, host nations, the FCC, and other Services in order to meet their increasing spectrum requirements. Increases in the density of spectrum-dependent equipment operating in the same bands result in increased operational conflict and a higher potential for interference. Without proper application of deconfliction procedures for the control of interference, operational failures will occur and liability claims may result from interference to commercial systems.

### **3-2. Scope**

This chapter applies to all active Army, ARNG, and USAR operations and the operation of spectrum dependent equipment required by the materiel development community involved. Such operations involve equipment herein defined as that designed to function using the radio frequency electromagnetic spectrum. Secondary effects of electromagnetic interference (EMI) to or from electric or electromechanical equipment, i.e., computers or electric motors, which are not intended to use the electromagnetic spectrum, are the responsibility of the Army E3 and equipment development organizations. The environmental effects of these devices must be considered and minimized through system analysis and design concepts.

Overall system compatibility between spectrum-dependent systems must be assured.

### **3-3. Management Requirements for Achieving Electromagnetic Compatibility (EMC)**

*a.* The Army considers EMC an essential characteristic of spectrum-dependent equipment in the same sense as reliability and the ease of maintenance. Thus, EMC analyses must be conducted to support each step of the design, development, acquisition, and use of this equipment.

*b.* As a time cost consideration, prior to entering any of the four phases of the Life Cycle System Management Model (LCSMM) or procuring commercial off-the-shelf (COTS) spectrum-dependent equipment, it is highly recommended that concept evaluators, PEOs, PMs, combat developers, and, in some cases, units themselves request that a spectrum supportability assessment be conducted to determine if the proposed concept or requirement will meet spectrum supportability and equipment compatibility requirements in all CONUS and/or OCONUS environments (see Chapter 4).

*c.* Each active Army, ARNGUS, and USAR organization and each individual that participates in managing the acquisition and use of spectrum-dependent equipment must stress the need to achieve EMC by accomplishing the following actions:

(1) Implement EMC decisions and actions during the LCSMM. EMC decisions and actions that occur during the four phases of the LCSMM are:

(a) Concept Exploration and Definition Phase.

1. For telecommunications equipment, there are two major milestones in the Concept Exploration Phase. The first milestone is the preliminary selection of the frequency band, including spectrum supportability, type of channelization, and other main characteristics of the system. The second milestone is the submission of a Stage 1, 2, and 3 DD Form 1494. Ensure the DD Form 1494 contains sufficient data for a subsequent review and evaluation of spectrum supportability. If required, obtain a spectrum assignment for experimental testing. Obtain an approved Stage 3 application or waiver for Milestone I Army Systems Acquisition Review Council or appropriate In-Progress Review (IPR).

2. For non-telecommunications systems (e.g., generators, vehicle motors, etc.) which do not use the spectrum, determine system technical characteristics. This determination must contain sufficient information to permit evaluation of the potential for unintentional susceptibility or unintentional radiation interference to the environment where their equipment will be operating.

(b) Demonstration and Validation Phase.

1. For this phase, first prepare the EMC-related portion of the equipment performance specifications for the prototype equipment. Second, develop plans for the EMC portion of developmental and operational test. Third, review results of EMC testing as part of Development Test (DT) and Operational Test (OT). Fourth, verify that potential EMC problems have been averted or can be expected to be resolved during engineering development.

2. Before Milestone II or appropriate IPR, the Stage 4 DD Form 1494 or waiver must be approved. The DD Form 1494 and all further forms must include the new data if there are changes to previously approved frequency allocations.

(c) Engineering and Manufacturing Development Phase. For EMC considerations and actions, complete the following actions:

1. Prepare EMC portions of equipment development specifications.

2. Prepare EMC portions of test plans for DT and OT.

3. Review EMC test results.

4. Verify EMC performance.

5. Prepare EMC portions of equipment specifications for initial production.

6. Obtain an operational frequency assignment if required.

7. Approve TOE material and training material.

(d) Production and Deployment Phase. For EMC considerations and actions, first prepare EMC portions of the production equipment specifications. Then verify performance by reviewing operational performance reports and reports of interference or EW.

(2) Conduct EMC environmental surveys. Conduct surveys either prior to or when installing or modifying spectrum-dependent equipment. If desired, these surveys may be accomplished by the USAISEC (AMSEL-IE-TS), Fort Huachuca, AZ 85635-5300, or the JSC, Army Director (AR), 120 Worthington Basin, Annapolis, MD 21402-5064.

(3) Resolve interference. Interference can be classified as local, regional, and/or national. Commands and agencies will attempt to resolve instances of interference within their area of responsibility. Reporting procedures for interference problems will be described in Paragraphs 3-8b and 3-8c and Appendix C.

### **3-4. USASC Services for the Electromagnetic Compatibility Program (EMCP)**

a. The USASC Spectrum Engineering Branch is the implementing organization for the operational EMC and propagation engineering (PE) program areas. These responsibilities are contained in AR 10-87.

b. The USASC will provide an operational EMC assurance capability to—

(1) Detect, report, and coordinate the solution and correction of operational EMC problems with the USACESO, and when necessary, the JSC.

(2) Assist the Army Spectrum Manager and the Army commanders in resolving operational EMC problems by providing technical assistance in spectrum engineering, propagation services, and the electromagnetic environment using both on- and off-site personnel and facilities.

(3) Conduct Electromagnetic Radiation Hazard (EMRH) surveys at conventional and special munitions storage and handling sites/areas for all levels of command.

(4) At the direction of the Army Spectrum Manager, and in coordination with the JSC Army Director and the CG, TRADOC, develop, manage, and operate EMC assurance training programs.

c. Provide a Quick Reaction Capability (QRC) for EMC assurance capable of responding to field missions immediately and providing an EMC team on-site within 24 to 72 hours to resolve interference problems. Required resource planning data will be coordinated with the USACESO.

d. Provide EMC engineering and analysis support to eliminate potential EMC/EMI problems for planned system upgrades, modifications, or new C-E system installations.

e. Provide radio wave propagation technical services to the Army and to other military services and Federal agencies as resources permit. Perform radio wave propagation path surveys, analyze radio frequency (RF) system performance, and design and analyze antennas. The results of the technical services (e.g., surveys, analyses, etc.) will be forwarded to the USACESO and the JSC Army Director.

f. Plan, program, budget, and provide resources for executing assigned spectrum management, EMC assurance, and EMC testing and evaluation responsibilities per this regulation.

g. Address requests for EMCP assistance to Commander, USASC, ATTN: DSED, Fort Huachuca, AZ 85613-5300, DSN 879-3068 (Commercial 520-538-3068).

### **3-5. US Army Test and Evaluation Command (USATECOM) Services for the EMCP**

a. USATECOM has the responsibility to provide a variety of EMC, EMV, database services and spectrum management process support to developers of Army electromagnetic spectrum-dependent equipment. These services are provided through the operation of the following subordinate elements located at the Electronic Proving Ground (EPG): the Battlefield Electromagnetic Environments Office (BEEO), Electromagnetic Environmental Test Facility (EMETF), and the EMI/TEMPEST branch.

b. The BEEO will—

(1) Support the Army EMCP through development, operation, and maintenance of databases for C-E compatibility and vulnerability analyses and concept studies.

(2) Develop, maintain, and operate the database element of the EMCP to provide timely scientific and technical support to the Army spectrum management program. These databases include equipment characteristics and measurements, organizational data such as TOE and Basis of Issue, tactical concepts and doctrine, and threat documentation.

(3) Develop, maintain, and operate simulated tactical deployments, based on approved scenarios, to include geographical locations, communications netting, frequency assignments and spectrum use. These deployments are down to the individual equipment operator level for US, Allied, and Threat forces.

(4) Conduct research and studies to design and develop other systems/capabilities as required to fulfill special database requirements.

c. The EMETF will—

(1) Assess the ability of Army systems and equipment to operate compatibly in their intended operational electromagnetic environment. Assessments will include the activities relevant to the C-E equipment systems under consideration and doctrine of both threat and friendly forces. Provide assessment service relative to both unintentional (compatibility) and intentional (vulnerability) interference.

(2) Assess the influence of the intended operational electromagnetic environment on Army systems and equipment concepts and the doctrine for their implementation.

(3) Maintain its support capability through three main capabilities which are:

(a) Electronic and electromagnetic measurements of equipment parameters and performance including electro-optical equipment employed by the US, Allied, and Threat forces.

(b) Databases describing the structure, activity, equipment parameters and geographic environment of deployments up to the level of a deployed Army corps, and its opposing threat force, in their expected tactical situation.

(c) Analytical capability which incorporates the electromagnetic results of the measurements and deployment database into computer models of C-E equipment employed by the Army in opposition to a corresponding threat force. The analysis will give measures of performance for systems being evaluated in either a one-on-one or many-on-many electromagnetic emitter environment.

d. The EMI/TEMPEST branch will make a TEMPEST assessment of the equipment or system ability to process classified information without risking compromise. The branch has a measurement capability that detects emanations from electronic and electro-mechanical equipment conformity to requirements in this area specified by NSA. Measurement data can be analyzed to ascertain the probability of the system under test being able to complete an assigned mission without risking compromise of classified information.

e. The EMETF facility and the EMI/TEMPEST branch will provide support for all phases of the LCSMM.

f. EMEFT services are provided to Army agencies on a cost reimbursable basis.

g. Address requests for EMCP services to Commander, EPG, ATTN: STEWS-EPG-TT, Fort Huachuca, AZ 85613-7110, DSN 879-4860 (Commercial 520-538-4860).

### **3-6. JSC Services for the EMCP**

a. As defined by DoD Directive 3222.3 and DoD Regulation 5000.2-R, the JSC is a Joint services activity that provides frequency spectrum engineering and EMC analysis support to all DoD components developing or operating telecommunications equipment.

b. Army components, as well as the joint services, have access to databases that contain electromagnetic environmental, electro-optical, equipment electromagnetic characteristics, frequency assignment and use, space systems orbital, tactical deployment, and topographical data. The JSC has the responsibility to maintain the frequency resource file for the DoD.

c. The JSC has both automated and manual EMC models ranging from antenna and propagation models to terminal-device-performance models. The JSC has adapted in-house models to meet the

specific needs of other DoD analysis centers and services operational units.

d. JSC services are available on-site at Army field commander locations worldwide.

e. The JSC provides services to Army agencies on a cost reimbursable basis.

f. Army organizations requesting spectrum management support or analytical services pertaining to existing or anticipated EMC problems should address their requests to the Commander, JSC, ATTN: AR, 120 Worthington Basin, Annapolis, MD 21402-5064, DSN 281-2103, Commercial (410) 293-2103, facsimile (410) 293-2631.

### 3-7. Deconfliction

a. Deconfliction is a systematic management procedure to coordinate the use of the electromagnetic spectrum for operations, communications, and intelligence functions. It is an element of electromagnetic spectrum management.

b. Deconfliction is comprised of three categories. They are:

(1) Friendly communications equipment interfering with friendly electronic support (ES) equipment (interfering with intercept operations).

(2) Friendly EA equipment interfering with friendly C-E equipment (jamming missions interfering with normal C-E operations).

(3) Hostile EA equipment interfering with friendly C-E equipment.

c. The Army Spectrum Manager shall advise the ARSTAF, MACOMs, and other Army organizations of trends in very high power emitters as a result of its coordination at Joint, national, and international levels; and, with awareness of the susceptibility levels identified by the E3 program, ensure that the spectrum management process disseminates appropriate alerts and coordination.

d. To accomplish deconfliction, Army battlefield spectrum managers continually coordinate the assignment of frequencies to battlefield systems to minimize electromagnetic spectrum conflicts or interference with the IEW units of friendly forces.

e. Information on the development and availability of automated deconfliction tools is available from the USACESO/(SAIS-PAS-M), DSN 227-0199.

### 3-8. Army Interference Resolution Program (AIRP)

a. The AIRP revolves around four functions:

(1) Direction Finding (DF). A DF capability is often the key to locating the source of interference and is an integral part of resolving and analyzing incidents and problems. The degree of accuracy is dependent on the environment and frequency band.

(2) Signal Monitoring. Signal monitoring or spectrum surveillance incorporates a frequency spectrum analyzer or surveillance receiver covering all spectrum bands of use. These systems perform real-time evaluation of spectrum usage and interference in a specific area.

(3) Signal Analysis. Analysis of DF and monitoring data is required to determine the source of interference and misuse of the spectrum.

(4) Transportability/Mobility. Degree, circumstances, and geographic location of the types of interference incidents and problems will determine transportability and mobility requirements. Mobile/transportable DF and monitoring equipment is a requirement for tactical units, training areas, and for incidents not necessarily confined to a specific geographical area. Man portable equipment should also be considered for certain instances and conditions. Fixed equipment would be required for those areas which require real-time solutions in a defined geographical area.

b. Responsibilities.

(1) The Army Spectrum Manager is responsible for reporting and coordinating the resolution of serious incidents of spectrum interference with appropriate HQDA and other Service activities, to include US civilian telecommunications organizations and host nations, if required.

(2) USASC is responsible for the dispatch of monitoring and DF teams to the affected site within 24 to 72 hours.

(3) AMC will maintain a database of spectrum interference incidents reported to HQDA/USACESO.

c. The procedures for reporting incidents of spectrum interference to Army forces located within CONUS are:

(1) CONUS-based Army forces involved with sustaining base operations will report spectrum interference to the supporting DOIM, who will make every effort to resolve problems locally within the installation/MACOM-owned assets.

(2) If the spectrum interference cannot be resolved locally, the supporting DOIM will report the problem to the supporting DoD AFC as depicted in Figures B-1 and C-2.

(3) If the AFC cannot resolve the problems regionally with other federal agency field offices (e.g., FCC, Federal Aviation Administration (FAA) Regions), the AFC will request the spectrum manager submitting the spectrum interference report to resubmit the spectrum interference report through command channels.

d. The procedures for reporting incidents of spectrum interference to Army forces located OCONUS are:

(1) Army forces stationed OCONUS will report spectrum interference to the supporting Joint Frequency Management Office (JFMO) in accordance with the guidelines contained in FM 24-35-1 and the JSIR Program. When required, reports may also be submitted to the spectrum managers supporting Army community commanders.

(2) Most instances of spectrum interference will be resolved locally with the Division and Corps. For those incidents of spectrum interference which cannot be resolved at echelons below Corps, a report will be sent to the Theater Army/CINC Joint Frequency Management Office (JFMO) headquarters for resolution. Where required, the JFMO will interface with the host nation through the Status of Forces Agreements.

(3) In cases where the JFMO cannot resolve the spectrum interference problem, Army users will submit reports to HQDA, ATTN: SAIS-PAS-M (The Army Spectrum Manager) and the USACESO. Army users may also be required to report to other activities through existing CINC directives.

(4) Interference to high frequency (HF), satellite, or troposcatter communications may involve reporting the interference to activities outside the Theater/CINC area of responsibility.

e. Incidents of harmful interference, whether occurring within CONUS or OCONUS, which cannot be resolved locally or regionally, may cause a serious threat to life or limb (i.e., interference to air traffic control, detonation of fuses to explosives, etc.); or may cause high-cost expenditure to the Army (e.g., delay or cancellation of a test), and therefore should be reported through Army interference resolution organizations (see Figure C-2). Action will be initiated by these offices to coordinate resolution of the interference problem with appropriate Army activities.

### 3-9. Army E3 Objectives Relating to Spectrum-Dependent Devices

a. The Army E3 objectives that relate to spectrum-dependent devices are:

(1) To achieve EMC for all spectrum-dependent equipment operated by the Army components.

(2) To attain built-in design compatibility, rather than achieve EMC through the use of planned product improvements (PPI) after development.

(3) To promote EMC philosophies and techniques in the acquisition and use of spectrum-dependent equipment.

(4) To promote total EMC test and analysis techniques of all systems with spectrum-dependent materiel.

b. Detailed procedures for implementing the Army E<sup>3</sup> Program are contained in Army Acquisition Executive (AAE) Policy Memorandum 91-3.



## Chapter 4 Frequency Allocation-to-Equipment Process

### 4-1. Introduction

*a.* The Frequency Allocation-to-Equipment Process supports the Army spectrum management goal as stated in Paragraph 1-6. Due to an exponential increase in electromagnetic spectrum use resulting from technological advancements, and as the spectrum is reallocated away from military use, achievement of this goal is critical. In the research, development, production, and procurement cycle, policy implementation must begin as early as possible. A means for early policy implementation is the Frequency Allocation-to-Equipment Process. This process prescribes policies, responsibilities, and procedures for Army commands, agencies, PEOs/PMs involved in conceptualizing research, development, production, procurement, modification/product improvement, and lease or use of spectrum-dependent materiel.

*b.* The Frequency Allocation-to-Equipment Process is a spectrum requirement and exists to determine that:

(1) If equipment can operate in spectrum bands per the national and international tables of spectrum allocation.

(2) Equipment being brought into the Army inventory conforms with applicable spectrum management regulations, directives, standards, and specifications.

*c.* A basic goal of the process is to assure spectrum supportability and equipment EMC. Procedures and requirements outlined in this chapter apply variously to different types of equipment methods of

acquisition. See Table 4-1 for the summary of equipment requiring spectrum applications.

### 4-2. Policies Concerning DD Form 1494

*a.* Funds for the research, development, production, procurement, modification/production improvement, and lease or use of spectrum dependent equipment will not be released by the obligating authority until an approved DD Form 1494 has been obtained per Paragraph 4-2f. DoD Regulation 5000.2-R, paragraph 4.4.7, mandates the determination of spectrum supportability prior to initiating cost estimates for development or procurement. The objective of the DD Form 1494 is the determination of spectrum supportability of spectrum dependent equipment and systems. Waivers for submitting the form are in Paragraph 4-6.

*b.* The DD Form 1494 establishes that a particular equipment/system has valid spectrum requirements and is not an approval document for use of frequency(ies). An approved DD Form 1494 is necessary to obtain a frequency assignment.

*c.* Compliance with guidance in the following documents is mandatory:

(1) The approved DD Form 1494.

(2) Memoranda and letters of transmittal (LOTs) from the Army Spectrum Manager, the USMCEB, and possibly, the NTIA, for equipment that operates within the US&P.

*d.* Contracting officers will comply with Defense Acquisition Regulations (DFARS) 235.071 and use the contract clause found at DFARS 252.235-7003 in all solicitations and contracts requiring frequency authorization.

**Table 4-1**  
**Summary of Equipment Requiring DD Form 1494**

Equipment Category	DD Form 1494 Required	Applicable Paragraph
All telecommunications emitters, e.g., radars, navigation, meteorological, ATC, maritime	Yes	4-3b(1)
EA Equipment/Threat Simulators	Yes	4-3b(2)
Receivers and antennas developed independently	Yes	4-3b(3)
Certain types of nontactical, commercial, intrabase radios	Yes	4-3b(4) or
Operations/test at—	Determined by local DoD AFC	USAKA 4-6b(1)
White Sands Missile Range		
Army Electronic Proving Ground		
Yuma Proving Ground		
Kwajalein Atoll (USAKA)		
Incidental radiation devices	No	4-6b(2)
Fuses and detonators	No	4-6c(5)
Commercial satellites	No	4-6c(6)
Low power devices	Yes	4-6c(1)
Industrial, scientific, and medical equipment	Yes	4-6c(2)
Ultrasonic equipment	(see limitations in applicable paragraph)	
	Yes	4-6c(3)
Lasers	(see limitations in applicable paragraph)	
Terms defined in Glossary.	Determined by USACESO/SAIS-PAS-M	4-6c(4)

*e.* Prior to entering the four phases of the LCSMM or procuring COTS spectrum-dependent equipment, it is required that concept evaluators, PEOs, PMs, combat developers and, in some cases, units themselves request that a frequency supportability assessment be conducted. These assessments will be conducted to determine if the proposed equipment will meet spectrum supportability and EMC in its intended operating environment. These assessments can take from 3-9 months to perform, users should plan accordingly in both time and money. Spectrum assessment can be conducted by several different organizations (e.g., JSC, ISEC).

*f.* An approved DD Form 1494 or waiver (Paragraph 4-6a) is required, as indicated below, in the LCSMM (AR 70-1 and DA Pam 11-25), and DoD Regulation 5000.2-R paragraph 4.4.7.

(1) During Phase I (Concept Exploration and Definition Phase)—Conceptual and Experimental Application (Stages 1 and 2).

(2) At Milestone I for systems that emit or receive Hertzian

waves; at appropriate IPR for non-major systems—Developmental Application (Stage 3).

(3) At Milestone II for systems that emit or receive Hertzian waves; at appropriate IPR for non-major systems—Operational Application (Stage 4).

### 4-3. Application for Spectrum Certification

*a.* Instructions for completing DD Form 1494 are included with the form. The certification request will include modifications of military standards, if needed, and supporting rationale, EMC studies already performed, a concept of operations, and a statement releasing the information to foreign nations (if equipment is intended to be used OCONUS). The completed form and supporting documents will be sent through command channels to USACESO (SFIS-FAC-P, 200 Stovall St., Room 9S65, Alexandria, VA 22332-2200).

*b.* A DD Form 1494 must be completed for all systems and

equipment that emit or receive Hertzian waves. Those systems and equipment include:

(1) All telecommunications emitters. All telecommunications equipment except those exempted by Paragraph 4-6.

(2) EA equipment and Threat simulators. Developers of EA equipment and Threat simulators will forward to USACESO, through appropriate command channels, a completed DD Form 1494 for each end-item of equipment. USACESO will provide MACOMs a copy of the DD Form 1494 for their use in developing spectrum engineering tools and conducting EMC analyses. When necessary, USACESO will, after coordination with appropriate command spectrum coordinators, furnish guidance to the developing activity regarding impact of equipment use on established Army services.

(3) Receivers and antennas developed independently. Developers of receivers and antennas will complete a DD Form 1494 for each receiver and antenna developed independently of transmitters or receivers.

(4) Non-tactical, commercial, land mobile radios (LMRs) procured without a DD Form 1494/ military nomenclature. To maintain accurate information and databases of Army telecommunications equipment using Army spectrum resources, MACOMs will submit a DD Form 1494 for those equipment already procured without a DD Form 1494 and in use at the MACOM. For anticipated procurement of new non-tactical, commercial, intrabase radios, commanders of MACOMs (posts, camps, and stations) must submit a DD Form 1494 for approval prior to procurement of the equipment to the USACESO (SFIS-FAC-P). Also, prior to contractual commitments, frequency assignments must be available as determined by the USACESO or AFC.

#### **4-4. Processing DD Form 1494**

a. Army personnel involved in the conceptualizing of research, development, production, procurement, modification/product improvement, and lease or use of spectrum-dependent materiel will initiate the Frequency Allocation-to-Equipment Process by completing and submitting DD Form 1494 with supporting documents (e.g., spectrum supportability/EMC assessments) to addressees indicated in Paragraph 4-3a.

b. USACESO will review the DD Form 1494 for completeness, accuracy, and initial determination of spectrum supportability. The DD Form 1494 will then be distributed to other organizations in parallel. This distribution may include the USMCEB, AFCs, holders of DD Form 1494s, the JSC (AR), and the NTIA/SPS if appropriate.

c. The military departments, unified commands CINCs as appropriate, and the JSC will review the form and provide EMC comments on the DD Form 1494 to the J-12 permanent Working Group.

d. The J-12 permanent Working Group will review the DD Form 1494 and the EMC comments to determine if the equipment or system can receive spectrum support in the geographic areas specified on the form. If the equipment or system is to be used outside of the US&P, unified command (CINCs) and host nation concurrence is required prior to approval.

e. The USMCEB guidance memorandum will outline general considerations and restrictions that apply to particular equipment. The guidance will also include recommendations of specific actions for approval or implementation. The memorandum will be returned to the originator through the USACESO. In addition to the memorandum, USACESO will prepare a LOT for approval by the Army Spectrum Manager that contains additional guidance, restrictions, and specific actions. The originator must comply with the instructions in both the memorandum and the LOT.

f. If there is a conflict between the USMCEB and the Army Spectrum Manager, then the papers (USMCEB memorandum, the DD Form 1494, and the JSC EMC comments) will be forwarded to the USMCEB Joint Frequency Panel (JFP) for resolution.

g. If the memorandum and the Army Spectrum Manager's LOT indicate approval with implementing guidance, the memorandum is then signed by the J-12 Working Group chairman.

h. The USACESO and USMCEB reviews normally take 90 to 120 days, depending on the type of equipment and its operational

environment. It may take 6 to 12 months to coordinate with host countries for frequency spectrum support. Therefore, originators will submit the DD Form 1494 during the LCSMM, as follows:

(1) Stage One—Planning (Conceptual); Phase I, LCSMM: submit per type of system below:

(a) Space Systems (including earth stations and terminals): submit 4 to 6 years, but not less than 2 years, before planned satellite launch.

(b) Terrestrial Systems: submit 3 years, but not less than 1 year, before planned procuring for experimentation.

(2) Stage Two—Experimental; Phase I, LCSMM: submit not less than 6 months before procuring for experimentation.

(3) Stage Three—Developmental: submit in order to be approved before Milestone I Review, or appropriate IPR, per type of system below:

(a) Space Systems: submit 2 years, but not less than 1 year, before a development contract award.

(b) Terrestrial Systems: submit not less than 6 months before a development contract award.

(4) Stage Four—Operational: submit in order to be approved before Milestone II Review or appropriate IPR. Submit at least 6 months before acquisition actions for all equipment that use satellites or spacecraft or have significant impact on the electromagnetic frequency spectrum. For all other equipment, submit at least 4 months before acquisition actions. Data on DD Form 1494 should be validated through measured data when possible.

#### **4-5. EMC and DD Form 1494 Reviews Required by the NTIA**

a. Reviews of certain new Federal Government telecommunications systems by the SPS are required prior to committing funds, entering into contracts, and assigning frequencies. These reviews apply to the following types of telecommunications systems:

(1) New space telecommunications systems or subsystems, as well as major modifications to existing systems, that involve the use of satellites or spacecraft.

(2) New terrestrial telecommunications systems or subsystems, as well as major modifications to existing systems, that have significant impact on the use of the electromagnetic spectrum.

(3) New, major, digitized voice systems, including modifications to existing systems or subsystems, that involve the 30-88, 138-174, and 406-420 MHz bands.

(4) All systems in the 14.4-15.35 GHz band.

(5) Systems or facilities that the NTIA, IRAC, or other Federal Government agencies refer to the SPS. Referral may result from factors such as system costs, importance, or from estimates of unusual or potential impact on other spectrum uses.

b. USACESO will submit the DD Form 1494 to the SPS for review. After reviewing the proposed system, the SPS will submit recommendations, with supporting documents on spectrum availability, through the IRAC to the NTIA.

c. The NTIA review will be returned to the Army originator through USACESO. In addition to the NTIA review, USACESO will prepare a LOT for approval by the Army Spectrum Manager which may include additional guidance, restrictions, and specific actions. The originator must comply with the instructions in the review and the LOT. The originator will submit a letter to USACESO stating how the recommendations and guidance of the review and LOT will be implemented. USACESO will keep the Army Spectrum Manager, MACOM spectrum coordinators, and other interested Army commands and agencies informed of the originator's progress in complying with the review and LOT implementation guidance.

d. If the NTIA review and the Army Spectrum Manager LOT both indicate disapproval, the originator will resubmit the DD Form 1494 when corrective action has been completed.

#### **4-6. Waivers and Exceptions**

a. Allocation approval waiver. If exceptional circumstances will not allow enough time (normally 90-120 days) to process a DD Form 1494, a "Release of Funds Waiver" may be requested. Such a

request will be forwarded to USACESO (SFI-FAC-P, 200 Stoval St., Alexandria, VA 22332-2200) along with the DD Form 1494 and special justification. The justification must show that:

- (1) Eventual approval of the form can reasonably be anticipated.
- (2) Waiting the normal processing time may not be in the best interest of the Army.

(3) As a result of coordination with the USACESO, it has been determined that an operating frequency could be assigned. USACESO will forward the "Release of Funds Waiver" to the Army Spectrum Manager (SAIS-PAS-M) for his signature of approval.

*b. Exceptions.* Exceptions to the requirements for submitting DD Form 1494 are limited to the following:

(1) White Sands Missile Range (WSMR), NM; the Electronic Proving Ground (EPG), Fort Huachuca, AZ; Yuma Proving Ground (YPG), AZ; and Kwajalein Atoll (USAKA). These installations are part of the National Military Test Ranges operated under the responsibility of the Army. The DoD AFC WSMR, and the DoD AFC AZ, have allocation approval authority for all emitting and radiating equipment involved in range activities in their geographic areas. Equipment approved by the DoD AFC for use in support of range activities may or may not require a DD Form 1494. The DoD AFC will independently decide on each equipment proposal. Approval by the DoD AFC does not assure that the form can or will be subsequently approved for use in other geographic areas.

(2) Incidental radiation devices. Exceptions are usually allowed for incidental radiation devices that radiate RF energy in the course of normal operation but are not designed to intentionally generate RF energy. Examples are clothes dryers, washing machines, electric typewriters, computers, and microwave ovens. These devices do not require a DD Form 1494 if the operating agency will either eliminate any harmful interference caused to an authorized radio service or obtain a waiver. For this equipment, the waiver process is covered by MIL-STD-481A, Paragraph 6.5. Waivers must be approved or disapproved by the local Materiel Review Board (MRB) or, in the absence of such MRB, the Contract Administrative Officer.

*c. Partial processing.* The Army Spectrum Manager may approve some equipment for use without completing the Frequency Allocation-to-Equipment Process, but only after the DD Form 1494 is submitted. This equipment is listed below:

(1) Low power devices. Low power or restricted radiation devices as specified in the NTIA Manual.

(2) Industrial, scientific, and medical (ISM) equipment. Radiation devices which use radio waves for ISM purposes. Purposes include the transfer of energy by radio. ISM equipment will not be used for radio communication unless constructed and operated per the limitations defined in the NTIA Manual.

(3) Ultrasonic equipment. Any equipment which generates RF energy and uses that energy to excite or drive an electromechanical

transducer for the production of sonic or ultrasonic mechanical energy. This energy is for ISM use and will not be used for radio or other communication purposes unless constructed and operated in accordance with the limitations defined in the NTIA Manual.

(4) Lasers. Use of lasers for telecommunications is an area of considerable study and research. In those instances where laser coding techniques are used in range finding, target acquisition/identification research and development, or any other type of laser coding experimentation that will lead to spectrum occupancy, materiel developers must coordinate with the USACESO to determine if a DD Form 1494 is required.

(5) Fuses and detonators. Items of materiel used solely to activate a fuse or detonator do not require a DD Form 1494. In some congested areas, controls may become necessary to avoid EMI caused by or to these devices. In a noncombat situation, the operation of such devices must not cause interference to authorized spectrum users. Assistance and guidance in the selection of appropriate operating spectrum bands is available from the USACESO.

(6) Commercial satellites. Satellites are registered by commercial companies and operate in commercial spectrum bands. A DD Form 1494 is not required.

*d. Radar design objectives and engineering criteria.* The provisions of MIL-STD-469A and the NTIA Manual, Section 5.3, are mandatory for all new radars. However, existing radar systems and equipment will not be converted solely to comply with the requirements of Section 5.3. In any instance of harmful interference involving the use of conforming and nonconforming equipment, the activity using the nonconforming equipment will make adjustments to eliminate the interference.

#### 4-7. EMC Standards for Telecommunications Equipment

*a. Categories.* Certain military and national standards for frequency spectrum-dependent equipment should be reviewed before the DD Form 1494 is completed. Some of these major standards are shown in related references in Appendix A and in Table 4-2. The equipment limitations, as shown on the DD Form 1494, must be compared to these standards during the Frequency Allocation-to-Equipment Process. Standards are in the following categories:

(1) *International standards and agreements.* Many factors that influence standards, equipment operation, and design are related to international agreements. Some of these, such as international aviation agreements, affect worldwide operations. Others, such as the North Atlantic Treaty Organization (NATO) standardization agreements, affect C-E operations only in certain areas of the world. The ITU Radio Regulations (RRs) and the BR recommendations constitute the basic international agreements affecting spectrum management.

**Table 4-2**  
**Applicability of Federal Government/Military Documents to Common Equipment Characteristics**

Characteristics	MIL-STD 188C	MIL-STD 461	MIL-STD 1572	NTIA 5.1	NTIA 5.3	NTIA 5.8
Transmitter:						
Harmonic <sup>1,6</sup> -attenuation	X <sup>1</sup>	X	X	X	X	X
Spurious attenuation	X <sup>1</sup>	X	X	X	X	X <sup>5</sup>
Tunability <sup>3</sup>	X		X	X	X	
Frequency stability	X <sup>2</sup>		X	X	X	X
Maximum emission bandwidth	X <sup>1</sup>	X			X	
Receiver:						
Spurious response	X <sup>1</sup>	X	X		X <sup>4</sup>	
Image response			X		X	
Frequency stability			X		X	

**Table 4-2**  
**Applicability of Federal Government/Military Documents to Common Equipment Characteristics—Continued**

Characteristics	MIL-STD	MIL-STD	MIL-STD	NTIA	NTIA	NTIA
Transmitter:	188C	461	1572	5.1	5.3	5.8
Minimum required acceptance bandwidth					X <sup>4</sup>	

**Notes:**

- <sup>1</sup> In some bands, MIL-STD 461 applies for transmitter attenuation and receiver response requirements.
- <sup>2</sup> MIL-STD 188C requires a maximum necessary bandwidth.
- <sup>3</sup> Where a standard has a channelization requirement, it is considered under tunability.
- <sup>4</sup> Paragraph 5.3.1 (Criteria B), NTIA Manual, has no image response or antenna requirements - see paragraph 5.3.2 (Criteria C), NTIA Manual.
- <sup>5</sup> Both the military and national standards define spurious emissions to include harmonic emissions; however, the military has separate requirements for harmonic attenuations.
- <sup>6</sup> Identification, Friend or Foe (IFF) Radar is lowered for criteria (Federal Aviation Administration Regulation 1010.51A and Air Traffic Control Radar Beacon Systems, IFF Mark XII Systems (AIMS) Technical Standard 65-1000). Where the criteria differs, the AIMS standard governs.

(2) *US national standards.* These apply to the design and use of equipment that is common to the military, other Federal Government agencies, and civil users. NTIA Manual, Chapter 5, lists many standards that apply to Federal Government agencies, including the DoD. Military equipment that will be used for tactical exercises or training in the US&P is subject to the provisions of the NTIA Manual. Included in the NTIA Manual are radar design criteria, standard emission designators, channeling plans, out-of-band emission limits, and other criteria. Army systems will be judged against the NTIA Manual throughout the system life cycle, and the NTIA Manual, Paragraph 8.3, should be followed when initiating a DD Form 1494.

(3) *Military documents.* Many military documents contain information important to the reduction of EMI. These documents are available through publication distribution channels. See Table 4-2 for applicability of Government and military documents to common equipment characteristics.

(4) *USMCEB documents.* USMCEB documents may provide design guidance and are referenced when developing new equipment and assigning frequencies for existing equipment. Often these documents are issued as standards, plan, etc. In general, those documents that affect equipment allocations are made available to the concerned Army commands. If not, contact USACESO (SFIS-FAC-P) for guidance.

(5) *Range Commanders' Council (RCC) standards and documents.* RCC standards and documents are national and service range agreements on certain performance levels and characteristics that apply to equipment used on the national and service ranges. Standards are formulated to make efficient use of the spectrum and provide for spectrum compatibility.

*b. Waivers.* A request for waiver of military standards requirements that pertain to spectrum supportability for spectrum-dependent equipment must be made through USACESO to the Army Spectrum Manager. Requests must include technical justification as to why standards should be waived and the economic impact if the request is not approved. The USACESO will assess the waiver justification and provide the Army Spectrum Manager with a written recommendation for approval or disapproval.

#### 4-8. Duties

*a.* The Army Spectrum Manager will approve or disapprove Army waivers to provisions of the Frequency Allocation-to-Equipment Process.

*b.* The USACESO will—

(1) Coordinate the processing of DD Form 1494 and associated documents with the Army Spectrum Manager (SAIS-PAS-M), the JSC, the USMCEB-FP, and the SPS.

(2) Return the following completed documents through command channels to the originator:

- (a) The DD Form 1494.
- (b) The USMCEB approval or disapproval.
- (c) As appropriate, the NTIA approval or disapproval.
- (d) An Army Spectrum Manager approved LOT with any further

guidance or restrictions. The LOT will include recommended actions. The originator will notify USACESO if there is a change in the proposed schedule.

(3) Provide the MACOM spectrum coordinators and director for spectrum requirements, PEOs, and other DoD/Army organizations and activities with a semiannual summary of the progress, problems, and trends of all DD Forms 1494 being processed. The semiannual summary will be provided not later than the last working day of March and September.

(4) Forward to appropriate Army commands or agencies those non-Army DD Forms 1494 which may have an impact on their operation, and collect impact analyses.

*c.* The MACOMs through USACESO will:

(1) Provide the MACOM coordinators and directors of spectrum requirements who will assist the PEOs/PMs, separate PMs, and other materiel development organizations and agencies in the processing of DD Forms 1494.

(2) Assist the Army Spectrum Manager and the USACESO in identifying spectrum management requirements in ODPs.

(3) Coordinate, within the materiel development community, the initiation of spectrum supportability assessments before Frequency Allocation-to-Equipment Process actions (DD Form 1494) are submitted.

## Chapter 5

### Spectrum Requests and Assignments

#### 5-1. Introduction

*a.* The Army Spectrum Manager also serves as the director of the USACESO. The Army Spectrum Manager has staff responsibility for development of Army concepts, plans, and policies for the employment of the electromagnetic spectrum and the allocation of frequencies.

*b.* The USACESO is responsible for managing spectrum and call sign assignments for the Department of the Army (DA) within the US&P, developing concepts, plans, and policies and, when tasked by the director, initiating actions for spectrum management to be implemented by the Army worldwide.

*c.* Spectrum requirements of Army components within unified commands will be satisfied by procedures established by the unified command. Call sign requirements for Army components will be satisfied using the provisions in this regulation and in allied communications publications.

*d.* The policy contained in this chapter is provided to:

(1) Accomplish effective use of the limited electromagnetic spectrum available for support of the Army commands, agencies, and activities within the US&P and Army components of unified commands.

(2) Promote rapid and direct action in responding to requirements submitted for spectrum and associated call sign assignments.

## 5-2. Spectrum Coordination Channels

CONUS and OCONUS spectrum management coordination channels are shown in Figure 2-1, Chapter 2.

*a. CONUS.* Commanders of CONUS posts, camps, stations, and activities will submit spectrum actions to the supporting AFC (Appendix B). Exceptions are applicants in Alaska and Hawaii, who will submit their applications as outlined in Chapter 2, paragraph 2-8e.

*b. OCONUS.* Overseas applicants will submit requirements according to directives of unified commands and/or host nation agreements. The CINC of each unified command will be responsible for all military use of frequencies within the CINCs geographical area.

*c. Army contractors.* Contractors will submit spectrum requirements in direct support of Army contracts through the appropriate PM Office responsible for administration of the contract. A contractor will request frequencies for a Joint-service contract from the military department that is the executive service for that contract. Frequency support for contractor communications needs, not required to meet specifications of the contract, must be obtained by the contractor through FCC channels.

## 5-3. Types of Spectrum Actions

Applicants will submit spectrum requests using the Standard Frequency Action Format (SFAF) unless directed to use another format by a unified command or host nation agreement. ACP 190, US Supplement-1(C) Appendix D, describes types of spectrum actions and coordination channels, and provides guidance and procedures for processing assignment requests.

*a. New assignments.* Request for a new spectrum assignment must contain the information required in the SFAF and any additional information necessary to provide a clear and accurate description of the requirement. Organizations and activities requesting temporary and/or exercise assignments may submit requests by message to the supporting AFC in abbreviated SFAF format.

*b. Lead-time for request.* If a request for assignments does not allow for the prescribed lead-times listed below, the applicant must provide an impact statement justifying the urgency.

(1) Normally a minimum of 120 days lead-time is required to process an assignment spectrum request.

(2) For requests that require coordination with the FCC, the FAA, or host nation, the lead-time is 180 days.

(3) SFAF message requests in support of temporary requirements and exercises require 60 days lead-time.

*c. Assignment deletions.* Using activities will submit requests for deletions of authorized frequencies by letter, message, e-mail, or by the bulletin board system using the SFAF, through spectrum management channels. Using activities will not submit deletion requests when the requirement for the spectrum ceases within 120 days of the expiration date of the authorization. Navigational aids (NAVAIDS) identifiers will be deleted when no longer required.

*d. Assignment modifications.* An applicant may request modification of any item in an assignment except for the frequency, serial number, and transmitter state/country fields. Changes for the actions listed in paragraphs 5-3a, 5-3b, and 5-3c require an application for a new assignment be submitted according to 5-3a, above. A request for modification must arrive at the supporting AFC not later than 120 days before the current expiration date or new required date.

*e. Renewals of frequency assignments with expiration dates.* If the user desires to renew a frequency with an expiration date, the user must submit a request, using the SFAF, to reach the supporting AFC no later than 120 days prior to the expiration date. When submitting a request for frequency renewal, the user will update the operational, technical, and geographical data which indicates how the frequency assignment is being used.

*f. Five-year review program.* Commanders of Army posts, camps, stations, and activities will establish a program of continuing review of frequency assignments and will delete or amend such assignments as appropriate. The supporting AFC will provide users a listing of frequency records requiring a five-year review/update.

## 5-4. Frequencies that do not require specific authorization

The following types of frequency usage require no specific authorization within CONUS:

- a.* International distress and emergency.
- b.* Miscellaneous radiating devices to include:
  - (1) Restricted radiation devices.
  - (2) ISM equipment.
  - (3) Radio receivers.
  - (4) Cordless telephones.
  - (5) Electronic fuzes.

## 5-5. Army Policy for Spectrum Assignments

General policy for spectrum assignments to be used within the Army are:

*a. Air traffic control.* Air Traffic Control frequencies will be used to control the movement of aircraft taxiing, departing and approaching Army airfields, and en route in controlled air space.

*b. Amateur frequencies.* The Army will not use frequencies designated for amateur radio users within the US&P during normal peacetime conditions, except as authorized by the NTIA or FCC. Frequencies and emissions shown in Figure 5-1 are for use in emergency areas, when required to make initial contact with Radio Amateur Civil Emergency Services (RACES) units. Activities may also use these frequencies for communications with RACES stations on matters requiring coordination.

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FREQUENCY	(REFERENCE FREQUENCY)	EMISSION
3997 kHz		6K00A3E
3998.5 kHz	(3997 kHz)	3K00H3E
53.3 MHZ		40K00F3E

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Figure 5-1. RACES frequencies

*c. Land Mobile Radio (LMR).* Due to congestion in the 148-150.8 MHZ and 162-174 MHZ bands, units requesting LMR frequencies will usually receive assignments in either the 138-144 MHZ or 406-420 MHZ bands unless there are operational needs which require the use of another band. Before deploying equipment overseas, users must assure that LMR frequency authorizations are available. The following policy also applies:

(1) Coordination must be made with supporting AFCs to determine if procurement of LMRs is frequency supportable.

(2) Currently, all LMR frequency assignments in the 148-150.8 MHZ band are governed by a USMCEB channeling plan, based on 25-kHz channelization. Command spectrum managers will replace LMR frequency assignments not divisible by 25-kHz (e.g., 148.065, 150.195, 150.195) with valid on-channel assignments at the earliest practical date. When command spectrum managers determine LMR frequencies are not in conformance with the USMCEB plan, the following special provisions will apply:

(a) When an Army unit is planning to replace off-channel radio equipment, the spectrum manager will determine if an on-channel frequency assignment can be obtained prior to ordering the new equipment.

(b) When an off-channel LMR is receiving interference from an on-channel system, and a frequency change is the most economical way to solve the problem, the off-channel net will change.

(c) If all the radio equipment on an off-channel net is turned in, the frequency assignment will be deleted immediately. Although the radios may be issued later to another unit or transferred to a new location, the off-channel frequency assignment will not be "held in reserve" for the new unit, nor will it be reassigned to a new location.

*d. Citizen band (CB) radios.* The following policy applies to Army users of CB radios:

- (1) Regulations governing the use of CB radios are found at 47

Code of Federal Regulations Part 95, Subpart D. Army radio stations may use frequencies in the 26.97-27.41 MHz band provided:

(a) Justification indicates such an assignment is necessary for inter-communications with non-Government stations.

(b) Approval for use on post, camp, or stations is subject to local requirements and restrictions of the installation commander.

(2) Possession of CB radios OCONUS is subject to national and international regulations. CB radios are not authorized for use OCONUS without host nation approval. Unified command directives apply. Coordinate CB radio use with the appropriate Army Component Spectrum Management Office. For more information on CB radios, see AR 25-1.

*e. Special considerations for CONUS HF requests.* The use of HF for domestic, point-to-point service within CONUS is limited to the following conditions:

(1) When providing instantaneous transmission of emergency, command control and alerting traffic of such importance as to affect the immediate defense and survival of the nation. In such cases, the following policy applies:

(a) Circuits will be in an operational status at all times and there will be on-the-air tests to assure readiness.

(b) Frequency assignment for such circuits will be protected commensurate to the importance of the communications requirement.

(2) When required in an emergency where life, public safety, or important property is in danger and other communications means are nonexistent, temporarily disrupted, or inadequate. Spectrum managers will ensure that command user training and equipment tests on frequencies in this category are conducted.

(3) When there is a need to provide a communications system manned by qualified operators who are military reservists, military affiliate radio station (MARS) affiliates, or personnel knowledgeable in tactical or training systems. These frequencies will not be used for traffic that can be routinely handled by other means.

(4) When other telecommunications facilities, such as the DCS and MARS, do not exist, are not practical for installation, and the use of frequencies above 30 MHz is not practical.

*f. Maritime mobile (MM) frequencies.* The 156.2475-157.45 MHz band is allocated for MM communications. In addition to the Government allocated sub-band, several channels are also available for government use as outlined in the NTIA Manual.

*g. Specialized mobile radio (SMR) service.* Government agencies, including the Army, are authorized to use the SMR service in the 806-824 MHz, 851-869 MHz, 896-901 MHz and 935-940 MHz land mobile bands under the following conditions:

(1) The Army will not establish an SMR system or provide an SMR service in the bands listed above. Army elements shall operate only as an "end user" with an FCC-licensed private carrier on a contractual basis. Since the SMR service is not considered to be in the common carrier service, spectrum authorization to federal agencies, including the Army, will be contingent upon the continuation of the negotiated contract with the private carrier.

(2) SMR systems are established by private commercial carriers and licensed through the FCC. After negotiating a contract to satisfy an Army requirement with a private carrier, Army elements will obtain spectrum authorization through NTIA to operate in the band corresponding to that in which the private carrier has been licensed, in the geographic area, by the FCC when becoming an "end user" in the SMR service. Federal agencies, including the Army, will not request SMR frequencies from the FCC.

(3) Army users submitting applications to NTIA to obtain frequency spectrum authority for SMR services will include the system name and the private carrier's name in SFAF Item 705, and the exact number of mobile receivers in SFAF Item 341.

*h. Trunked land mobile radio (LMR) system.*

(1) A trunked LMR system is a spectrum efficient method to meet non-tactical LMR operational requirements. Army installations may be the lead agency for such systems, and Army units may share use of an existing or planned system sponsored by another military

service or federal agency. AR 25-1 and AR 25-3 provide IM and acquisition policy and procedures for these systems.

(2) Policy:

(a) Army units and agencies managing trunked LMR systems shall allow access by other federal agencies to the trunked system where it is operationally and technically feasible.

(b) Army and NTIA validated LMR system approval is required prior to purchase.

(3) Procedures: If the Army is the lead agency for a trunked LMR system, the Army installation or activity commander will comply with procedures outlined in the NTIA Manual. The procedures are essentially a two-step process: 1) Obtain Federal system approval from the SPS; and 2) obtain frequency assignments for the trunked system. NTIA will not issue frequency assignments for a trunked LMR system until the SPS has written system review approval.

(4) Army units and agencies are required to submit usage reports to USACESO (SFIS-FAC-P, 200 Stovall St., Room 9S65, Alexandria, VA 22332-2200). NTIA requires information for the first five years of operation of a trunked LMR system. Information to be reported is outlined in the NTIA Manual, and the reports must be submitted annually. The reported information is required to justify and defend trunked LMR systems nationally and as the basis for justification for additional channels.

*i. Satellite communications.* The following procedures apply:

(1) Defense Satellite Communications System (DSCS). Procedures for coordinating use of the DSCS and assigning of frequencies in the 7.25-7.75 GHz and 7.75-8.4 GHz bands, see Field Manual (FM) 24-11.

(2) Ground Mobile Forces (GMF). Procedures for coordinating use of GMF satellite access and assigning frequencies in the 225-400 MHz band, see Field Manual (FM) 24-11.

(3) Commercial Satellite Communications (SATCOM). Procedures for coordinating and assigning frequencies for commercial SATCOM are contained in the NTIA Manual.

## 5-6. Spectrum Coordination Procedures

Specific coordination requirements and procedures are contained in ACP 190, US Supplement - 1(C), Appendix D.

## 5-7. Spectrum Requests in Non-Government Bands

The Army is authorized by Chapter 7 of the NTIA Manual to use frequencies in certain non-Government bands to meet peacetime tactical and training requirements, as well as certain other bands for test range requirements. Frequencies will be assigned by the supporting AFCs only when spectrum requirements cannot be satisfied in Government bands and when operation will not cause interference to non-Government service. The Army will have to accept interference caused by authorized non-Government users. Military use of a particular frequency in these bands will not preclude new non-Government assignments on that frequency. Specific policy concerning assignments in the above bands is:

*a. Government users in non-Government bands.* Government users may obtain agreement from the FCC to use frequencies allotted to non-Government operations. Such cases must meet the following minimum criteria before submitting the request through spectrum coordination channels:

(1) The assignment must be essential for communications with non-Government activities and cannot be met through use of regularly designated Government bands. For example an Army installation Provost Marshal wishes to operate in a local county or municipal police net, Army Medical Evacuation (MEDEVAC) helicopters wish to operate in a state-wide medical evacuation net, or an installation fire department wishes to operate in a local county or city fire department net.

(2) The FCC licensee and the requesting agency have concluded a mutually approved arrangement, and the licensee has provided written authorization for the Army unit to operate on the particular frequency. The requestor will forward a copy of this authorization to the supporting AFC.

(3) The intended operation will not prohibit expansion of the

non-Government services for which the frequencies are allotted and will be:

- (a) Conducted in the geographical area of the licensee.
- (b) Restricted to the purpose for which the particular frequency is authorized to the non-Government stations.
- (c) Operated per FCC rules and regulations.
- (d) Terminated if it causes harmful interference to the non-Government stations.

*b. Operation and registration of FCC-licensed stations on Army installations.* CB, amateur, taxi companies, and other radio stations that are FCC-licensed may transmit on Army installations, but will be subject to limitations imposed by the installation commander. Limitations, if any, will be an installation regulation. The regulation must not impose limitations so severe that they unnecessarily infringe on the rights of the individual to operate a radio according to FCC rules and regulations. Users must coordinate with the installation DOIM or spectrum manager prior to operation of such equipment on the installation.

### 5-8. International Registration

The following policy applies to the registration of Army frequencies used in foreign countries:

- a.* Frequencies used by Army activities on foreign soil can be registered with the International Frequency Registration Board (IFRB) by the Army per USMCEB-M88-83 or by the foreign country in its own name.
- b.* If the foreign country insists on registering frequencies used by the US military forces in its territory, the agreement will at least provide that:
  - (1) The registration will not affect existing US registrations.
  - (2) The country will cancel, upon request by the US authorities, any registrations made to support US operations.
- c.* Arrangements with foreign countries for international registration of frequencies are of joint interest to the military Services. Therefore, the Services will coordinate with the joint FP, USMCEB before concluding any arrangements.

### 5-9. Electronic Attack (EA) Training

- a.* Approved DD Form 1494 and frequency assignments are not approval documents to conduct EA operations (e.g., jamming, chaff drops).
- b.* EA frequency clearances are granted as follows:
  - (1) CONUS: Under provisions of AR 105-86, AFC AZ, AFC WSMR, and AFMO-CONUS may provide local EA clearances limited to certain frequency bands under specified conditions. EA clearances requiring national level coordination with the other Military Services and Government agencies are issued by USACESO (SFIS-FAC-S, 200 Stovall St., Room 9S65, Alexandria, VA 22332-2200).
  - (2) OCONUS: Overseas applicants will submit EA requirements according to directives of unified commands and/or host national agreements. The CINC of each unified command will be responsible for all military use of frequencies including EA within the geographical area.
  - (3) Users of the equipment must comply with local EA frequency clearances, host nation agreements, unified command directives, USMCEB policy and procedures, and DD Form 1494 with Army Spectrum Manager's LOT.

## Chapter 6 Radio Station Identification

### 6-1. General

The three main categories of radio station identification used by the US Army are international call signs, positive voice identification (PVI), and tactical call signs. In Army usage, a call sign is a combination of letters and digits. Call signs are used to establish and maintain communications. Call signs are to identify the radio stations of command authorities, activities, facilities, units, elements, or

individual positions. Call Signs Are Not Used to Identify People. PVI is a less formal means of identification used instead of international call signs for many non-tactical purposes. Call words, e.g., RED DOG 6 or SPEEDY TULIP 3, are authorized for communications ONLY when operating in a secure mode. This applies to aeronautical, maritime, and ground stations alike.

### 6-2. Responsibility for Radio Station Identification

The Military Communications Procedures and Publications Panel of the USMCEB is responsible for radio station identification within DOD. As a principal member of the USMCEB, HQDA DISC4 (SAIS-PAS-M) ensures decisions of the USMCEB are carried out within the Army. USACESO is responsible for nontactical call sign management within the Army (Mailing address: USACESO, ATTN: SFIS-FAC-M, 200 Stovall St., Room 9S65, Alexandria, VA 22332-2200).

### 6-3. International Call Signs

International call signs are governed by the rules of the International Telecommunication Union (ITU). These call signs use specific characters in the first, or first two positions, to identify the nationality of the station. These characters are listed in the Table of Allocations of International Call Sign Series contained in the ITU radio regulations. The following types of international call signs, together with specific suballocations are used within the US Army.

- a.* Fixed service radio stations.
- b.* Land mobile service.
  - (1) Base radio stations. (In Army use, the basic call sign normally includes the associated land mobile stations.)
  - (2) Land mobile radio stations (independent land mobile stations only).
- c.* Aeronautical mobile service.
  - (1) Aeronautical radio stations.
  - (2) Aircraft radio stations.
- d.* Maritime mobile service.
  - (1) Coast radio stations.
  - (2) Ship radio stations.
  - (3) Ship radio teleprinters.
- e.* Space service earth stations.
- f.* Experimental radio stations.

### 6-4. International Call Sign Assignment Authority

Army authority for assigning international call signs is further delegated as follows:

- a.* Fixed service radio station call signs for the USACE. These call signs will be assigned and maintained by the US Army Communications-Electronics Services, 200 Stovall Street, Attn: SFIS-FAC-M, Alexandria, VA 22332-2200. The block of call signs WUA through WUZ has been suballocated for this purpose.
  - (1) A three letter call sign is assigned to all USACE activities.
  - (2) The district call sign may be suffixed by one digit.
- b.* Military Affiliate Radio System (MARS). The Chief, Army MARS will assign call signs for the Army MARS Program. MARS call signs are assigned per AR 25-6 and the call sign patterns are assigned per FM 11-490-7. Correspondence will be addressed to Commander, US Army Information Systems Command, Attn: Chief Army MARS, Fort Huachuca, AZ 85613.
- c.* Shipboard Radio Stations.
  - (1) A ship radio authorization (SRA) is required for the operation of a non-tactical shipboard radio station used on any watercraft that is:
    - (a) Owned and operated by the Army.
    - (b) Operated by the Army with Army (civilian or military) radio operators, such as watercraft under bareboat, time voyage or other similar charter.
  - (2) SRAs are not issued for:
    - (a) Army watercraft operating solely in a tactical environment, and which do not have a requirement to employ non-military frequencies and call signs. Tactical frequencies and call signs will be assigned by appropriate service or unified command authorities.
    - (b) Shipboard radio stations whose radio operators are not Army

(civilian or military) personnel. An FCC license is required when a watercraft is chartered or otherwise used under Army direction, and the shipboard radio station is operated by personnel not directly responsible to Army authority.

(3) Correspondence for the assignment, renewal or cancellation

of an SRA will be forwarded through appropriate command channels to USACESO, ATTN: SFIS-FAC-M, 200 Stovall St., Room 9S65, Alexandria, VA 22332-2200.

(4) Requests for SRAs require the information contained in Table 6-1.

**Table 6-1**  
**Request for SRA**

ITEM	DATA REQUIRED	EXPLANATION
1.	Official watercraft name or designation	
2.	Former name(s) or designation(s) of watercraft, if any	
3.	Army authority over watercraft	a. Owned b. Operated c. Leased d. Other
4.	Description of transmitting equipment (radar, communications, position finding)	a. Equipment make or manufacturer b. Model number c. Frequency tuning range d. Specific frequencies to be used e. Frequency band required for radar f. Type(s) of emission required g. Power output h. TELEX ID i. Is DSC ID required? j. Will vessel sail in international waters?
5.	Controlling authority	a. Army command exercising operational control b. USACE districts c. Point of contact and telephone number

(5) SRAs will remain in effect for a period of 3 years from the last day of the month in which issued. Renewal requests must be received by USACESO at least 30 days before the expiration date indicated on the SRA. SRAs not renewed within the above time periods will be cancelled, and may be issued to another station.

(6) Significant changes in data items in Table 6-1 will be reported to USACESO within 90 days.

(7) Users will submit to USACESO a request for cancellation of an SRA when radio equipment is permanently removed from the watercraft, or the watercraft is sunk, scrapped, transferred from Army control or disposed of by other means.

(8) Assignment authority for SRA call signs. All shipboard radio station call signs are composed of four letters and are assigned by the USACESO. Call signs will only be assigned in conjunction with an SRA and are allocated as follows:

- AAAA-ADZZ US Army owned/or operated watercraft, less Corps of Engineers
- AEAA-AEZZ Corps of Engineers floating vessels
- ALAA-ALZZ Spares for future assignment

(9) Assignment authority for Shipboard Radio Teleprinter (TELEX) identifiers. These identifiers will be assigned in conjunction with an SRA. TELEX have a five digit numeric identifier, in addition to the ship radio call sign, and are required for the operation of radio teleprinter equipment onboard Army watercraft.

(10) Digital Selective Calling (DSC) Identification Number. A nine digit numeric identifier, in addition to ship radio call sign, is required to operate digital maritime telecommunications systems. These identification numbers will be assigned by USACESO in conjunction with a SRA.

d. Nontactical earth stations in the space service. These stations will be issued international call signs. Call signs will consist of two letters followed by three digits and are allocated as shown:

- AA200-AA299 AFMO CONUS (for Eastern US)

- AA300-AA399 AFMO CONUS (for Central US)
- AA400-AA499 AFMO CONUS (for Western US)
- AA500-AA599 AFC-WSMR
- AA600-AA699 AFC-AZ
- AA700-AA799 AFC-MDW
- AA800-AA899 USACESO
- AB200-AB999 USARPAC (for Pacific)
- AC200-AC999 USACESO
- AD200-AD999 USACESO
- AE200-AE9995th Signal Command (for Europe and the Middle East)
- AL200-AL999 USARPAC (for Alaska)

e. Experimental call signs. Each call sign will consist of two letters followed by a number, the letter "X", and another letter. Assignment authorities for experimental call signs are AFMO CONUS, AFC-AZ, AFC-WSMR, and USACESO. These call signs will:

- (1) Be assigned solely to identify emissions that are definite parts of an experimental operation.
- (2) Not be used to identify communications support operations.
- (3) Be allocated as listed below:

- AA2XA-AE2XZ AFMO CONUS (Eastern US)
- AL2XA-AL2XZ AFMO CONUS (Eastern US)
- AA3XA-AE3XZ AFMO CONUS (Central US)
- AL3XA-AL3XZ AFMO CONUS (Central US)
- AA4XA-AE4XZ AFMO CONUS (Western US)
- AL4XA-AL4XZ AFMO CONUS (Western US)
- AA5XA-AE5XZ AFC-WSMR
- AL5XA-AL5XZ AFC-WSMR
- AA6XA-AE6XZ AFC-AZ
- AL6XA-AL6XZ AFC-AZ
- AA7XA-AE7XZ AFC-MDW
- AL7XA-AL7XZ AFC-MDW



- AA8XA-AL8XZ Reserved for USACESO
- AL8XA-AL8XZ Reserved for USACESO
- AA9XZ-AE9XZ Reserved for USACESO
- AL9XA-AL9XZ Reserved for USACESO

f. Land mobile stations in the land mobile service. Generally, land mobile stations derive their call signs as subunits of their base station's call sign.

(1) The individual land mobile stations operating within those nets will share the base station call sign by adding digits or letters for unit identification as determined by the net control (for example, STATION CHARLIE; UNIT ONE-SIX; or MOBILE SEVEN).

(2) However, if a land mobile station is set up independent of a base station, the mobile station must be assigned its own international land mobile call sign.

g. Land mobile call signs are assigned to independent land mobile stations. They may be assigned in instances of a mobile operation in a nontactical environment and may transit over two or more Army areas or have a broad range. Generally, positive voice identification is used. These land mobile call signs consist of two letters followed by four digits. Call signs are allocated as indicated below:

- AA2000-AA2999 AFMO CONUS
- AA3000-AA3999 AFMO CONUS
- AA4000-AA4999 AFMO CONUS
- AA5000-AA5999 AFC-WSMR
- AA6000-AA6999 AFC-AZ
- AA7000-AA7999 AFMO CONUS
- AA8000-AA8999 USACESO
- AA9000-AA9999 USACESO

h. Army aircraft in nontactical aeronautical mobile service. Normally, these aircraft operate using voice transmissions (telephony) and will use FAA identification procedures. If Army nontactical aircraft must transmit in other modes (for example, teletypewriter or continuous wave), an international call sign must be obtained. Aircraft call signs consist of five letters and are assigned from the block ADAAA through ADZZZ. Call signs are assigned by USACESO.

i. Army international call sign prefixes for all other fixed service and land radio stations (base, aeronautical, and coast). USACESO has suballocated these prefixes to the AFC or spectrum managers for specific geographical areas. In the past, fixed and land radio station call signs were assigned from the Army's resources. More recently, within the US&P, the provisions of PVI (para 6-7) have been substituted wherever practical. However, configured call signs will be used where the geographical location of the station, the authorized power and/or the propagation characteristics are such as to create instances of possible harmful frequency interference beyond US&P boundaries. The suballocated prefixes for specific geographical areas are indicated below:

- AAB AFMO CONUS (Eastern US)
- AAC AFMO CONUS (Eastern US)
- AAD AFMO CONUS (Eastern US)
- AAE AFMO CONUS (Central US)
- AAF AFMO CONUS (Central US)
- AAG AFMO CONUS (Western US less Arizona and WSMR)
- AAH AFMO CONUS (Western US less Arizona and WSMR)
- AAK USACESO

*Note.* For transportable communications vans-worldwide. When used, to be suffixed with the last three digits of the authorized serial number of the van. *Note:* This call sign to be used only when operating independently. When replacing or augmenting an existing Defense Communications System station, the call sign of that station will be used.

- AAW AFC-WSMR

- AAZ AFC-AZ (State of Arizona)
- ABA-ABZ USARPAC (Hawaii and East PAC)
- ACA-ACZ AFMO CONUS (Caribbean)
- ADA USARPAC (Far East)
- ADB USARJ (Okinawa Prefecture)
- ADC USARPAC (Far East)
- ADD USARJ (Japan)
- ADE-ADZ USARPAC (Far East)
- AEA-AEZ 5th Signal Command (Europe and Middle East)
- WAR AFC MDW (MDW)

(1) Call signs that consist of three letters will be assigned to fixed stations serving as theater or area administrative net control stations.

(2) Call signs that consist of three letters suffixed with one digit will be assigned to coast stations.

(3) Call signs that consist of three letters suffixed with two digits will be assigned to all other fixed stations and to aeronautical stations.

(4) Call signs that consist of three letters suffixed with three digits will be assigned to base stations in the land mobile service (for example, guard, fire, and vehicle dispatching nets). Digits 0 and 1 will not be used after the third letter of the prefix.

j. Repeater and relay stations. International call signs will not be assigned to a station mainly to identify repeater or relay functions. Emissions from repeater and relay stations are normally identified by the call sign of the distant station keying the equipment. For local testing of such equipment, a form of PVI may be used (for example, FORT BLISS FIVE NET REPEATER - TESTING).

## 6-5. Publications

Army assigned international call signs are published in the documents listed below. The activity assigning the call signs ensures that pertinent information on all new assignments, deletions, or changes is furnished, in decode format, to the preparing agency as soon as possible for inclusion in the proper publications.

a. ACP 100, US SUPP-1.

- Fixed service stations
- Land mobile service stations
- Aeronautical mobile service stations
- Coast stations
- Experimental stations
- Space service stations

b. ACP 113. Ship stations

## 6-6. Security

International call signs assigned to stations operating in permanent places must be unclassified. While it may be necessary to classify information on a communications facility or specific nontactical operation during planning and development, once the station becomes operational, the call sign and location can no longer be protected. If the specific mission or function of the station is not given during transmissions, that type of information might continue to be classified. However, unclassified listing of the call sign, geographical location, and description must be published in appropriate international listings. These listings will help to identify harmful interference. Guidance on the security of call signs is in ACP 121, Chapter 5, and ACP 122, Chapter 4.

## 6-7. Positive Voice Identification (PVI)

a. Within the US&P the use of PVI procedures in place of international call signs is encouraged. PVI may be used for most nontactical radio nets using LOS type transmissions. However, PVI will not be used when any combination of the geographical location of the station, authorized output power, and normal radio propagation characteristics could cause harmful frequency interference across the boundaries of any foreign country. In this case, international call

signs must be used. Those very high frequency, ultrahigh frequency, and super high frequency stations that transmit within 200 kilometers of the boundary of a foreign country and all very low frequency, low frequency, medium frequency, and high frequency radio stations, regardless of location, are potential sources of interference.

*b.* PVI will consist of the word "ARMY," the geographical location of the station or operation, and the type of operation. Examples are: ARMY FORT KNOX POST TAXI DISPATCHER and ARMY FORT BELVOIR MAP SURVEY BASE.

*c.* The associated mobile stations will be identified by suffixing numbers or letters. Examples are: ARMY FORT KNOX POST TAXI UNIT TWO-ONE and ARMY FORT BELVOIR MAP SURVEY TEAM THREE. During reliable communications, when it appears that there is no conflict with other operations, PVI may be abbreviated to aid operations. However, at the beginning and ending of operations, and hourly during operations, the base stations should use the full PVI at least once.

*d.* When using telephony, Army nontactical aeronautical stations will normally use PVI. PVI will consist of the names of the aeronautical station, followed by the function. Examples are: DAVISON TOWER and GOODMAN GCA.

### **6-8. Tactical Call Signs**

*a.* General. Tactical call signs consist of various combinations of letters and digits. The use of character sequences configured in accordance with ITU Radio Regulations, article 19, should be avoided if possible. Tactical call sign systems are developed to meet specific military requirements under an exemption to the ITU Radio Regulations. See AR 25-1 for information on specific tactical call sign systems and their use.

*b.* Composition. Tactical call signs assigned to US Army units for use in intra-Army or joint operations, when the joint commander concurs, consist of basic letter-number-letter combinations to indicate the command. The numbers "01 through 99" are suffixed to indicate the specific subordinate command, title or position, or mission or functions of the using element. The two-digit suffix may be expanded by the letters "A through Z," when required, to further identify associated subelements.

### **6-9. Special Call Signs/Call Words for Army Aircraft**

Non-tactical Army aircraft may be granted the use of call words. Only those call words authorized by the Federal Aviation Administration (FAA), and listed in the Joint Communications Publications (JANAP 119) will be used. Requests for call words must be forwarded through appropriate command channels to USACESO, ATTN: SFIS-FAC-M, 200 Stovall Street, Room 9S65, Alexandria, VA 22332-2200.

### **6-10. Amateur Radio Call Signs**

Amateur radio station call signs are not assigned by the Army. A license that includes a proper call sign for the desired type of operations must be obtained from the FCC or host foreign government (if applicable). Examinations are required for an amateur radio license. The license conveys major operating privileges. AR 105-70 encourages and supports amateur radio activities. Before operating an amateur radio station on an Army post, camp, or station, coordinate with the local C-E officer, DOIM, or spectrum manager. See AR 105-70 for additional information.

## **Appendix A References**

### **Section I Required Publications**

#### **AR 10-87**

Major Army Commandas in CONUS (Cited in para 2-23g, 2-23h, and 3-4a.)

#### **AR 25-1**

The Army Information Resources Management Program (Cited in para 1-1e, 1-7, 2-7z, 2-171, 2-23a, 5-5d, 5-5h, and 6-8a.)

#### **AR 25-3**

Army Life Cycle Management of Information Systems (Cited in para 1-8c, 2-8u, 2-13f, 2-15p, 2-23a, and 5-5h.)

#### **AR 70-1**

Army Acquisition Policy (Cited in para 1-8c, 2-6g, 2-7n, 2-19h, and 4-2f.)

#### **DFARS 235.071**

Defense Acquisition Regulations (Cited in para 4-2d.)

#### **DoDD 3222.3**

Department of Defense Electromagnetic Compatibility Program (Cited in para 2-6f and 3-6a.)

#### **DoDD 4650.1**

Management and Use of the Radio Frequency Spectrum (Cited in summary, para 1-8b, and 2-7h).

#### **DoDD 5000.1**

Defense Acquisition.

#### **DoDR 5000.2-R**

Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS) Acquisition Programs (Cited in para 1-8c, 3-6a, 4-2a, and 4-2f.)

#### **DoDD 5200.1R**

Information Security Program Regulation.

#### **NTIA Manual**

Manual of Regulations and Procedures for Federal Radio Frequency Management (Cited in para 4-6c, 4-6d, 4-7a, 5-5f, 5-5h(3), 5-5i(3), and 5-7.) This document is available from the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954, Stock Number 903-008-00000-8, Telephone: (202) 512-1800.

### **Section II Related Publications**

#### **OMB Circular A-11**

Office of Management and Budget Circular A-11, Preparation and Submission of Budget Estimates.

#### **Administrative Procedures Manual**

Administrative Procedures Manual, US Military Communications-Electronics Board (USMCEB) This document is available from the USMCEB, Room 1E833, Pentagon, Washington, DC 20310.

#### **AAE 91-3**

Army Acquisition Executive (AAE) Policy Memorandum 91-3. (Army Electromagnetic Environmental Effects (E<sup>3</sup>) Program Implementation).

#### **AR 1-1**

Planning, Programming, Budgeting and Execution System.

#### **AR 5-3**

Installation Management and Organization.

#### **AR 11-2**

Management Control.

#### **AR 11-7**

Internal Review and Audit Compliance (IRAC) Program.

#### **AR 25-6**

Military Affiliate Radio System (MARS).

#### **AR 40-46**

Control of Health Hazards from Lasers and Other High Intensity Optical Sources.

#### **AR 71-9**

Materiel Objectives and Requirements.

#### **AR 95-2**

Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids.

#### **AR 105-70**

Amateur Radio Operations.

#### **DA Pamphlet 25-1**

Army Information Architecture.

#### **DA Pamphlet 25-2**

Information Mission Area Planning Process.

#### **TB Med 523**

Control of Hazards to Health from Microwave and Radio Frequency Radiation and Ultrasound.

#### **DoD ECAC Frequency Resource Record System Handbook**

This document is available from the JSC, 120 Worthington Basin, Annapolis, MD 21402-5064.

#### **ITU Radio Regulations**

This document is available from the ITU, Geneva, Switzerland.

#### **MIL-STD-188-100**

Common Long Haul and Tactical Communications System Technical Standards.

#### **MIL-STD-461.D**

Requirements for the Control of Electromagnetic Interference Emissions and Susceptibility.

#### **MIL-STD-469A**

Radar Engineering Design Requirements for Electromagnetic Compatibility.

#### **FM 24-11**

Tactical Satellite Communications.

#### **JSC-CR-90-079**

DD Form 1494 Preparation Guide for Army Frequency Allocations. This preparation guide is available electronically on the Army Spectrum Management Home Page at—  
[http://www.spectrum.gen.va.us/ceso/engr/spec\\_engineer.htm](http://www.spectrum.gen.va.us/ceso/engr/spec_engineer.htm)

### **Section III Prescribed Forms**

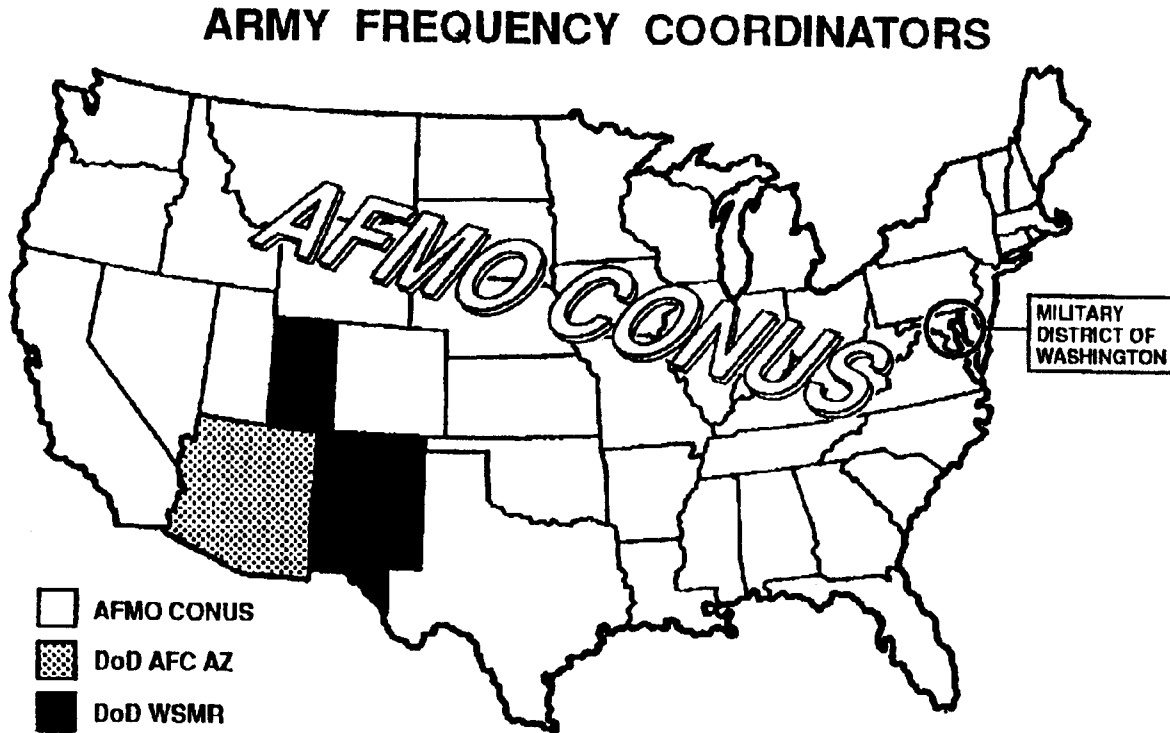
# Section IV Referenced Forms

DA Form 2028

## Appendix B Army Frequency Coordinators

### B-1. Areas of Responsibility for AFCs

Areas of responsibility for Army Frequency Coordinators/Management Offices are shown in Figure B-1.



Note: Alaska and Hawaii: USARPAC

Figure B-1. Areas of responsibility for Army Frequency Coordinators

### B-2. Frequency Coordinators Addresses

The Frequency Coordinators addresses and areas of responsibility are listed below.

a. Army Frequency Management Office, Continental United States

Fort Sam Houston, TX 78234-5032, Telephone: (210) 221-2820  
DSN: 471-2820/FAX:-2844.

Alabama, Arkansas, California (less units located on or conducting training of the Army National Training Center, Fort Irwin, CA), Colorado, (less the area west of 108EW), Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland (less certain areas which are included in the Military District of Washington), Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas (less Fort Bliss and US Territory within 240-kilometer radius of White Sands Missile Range), Utah (less the area east of 111EW), Vermont, Virginia (less

certain areas which are included in the Military District of Washington), Washington, West Virginia, Wisconsin, Wyoming, Puerto Rico, and the Virgin Islands.

b. Area Frequency Coordinator, State of Arizona, Fort Huachuca, AZ 85613-5000, Telephone:(520) 538-6423 DSN:879-6423/FAX:-8525

Arizona

c. Area Frequency Coordinator, White Sands Missile Range, New Mexico 88002-5526, Telephone: (505) 678-5417 DSN: 258-3702/FAX:-5281

New Mexico, US territory within a 240-kilometer radius of (White Sands missile range (including fort bliss, tx) plus the area of Utah and Colorado that lies within 108N and 111N West.

d. Deputy Chief of Staff for Information Management, Military District of Washington, ATTN: ANMY-IMO-O, Fort Lesley J. McNair

Washington, DC 20319-5050 Telephone: (202) 475-2799  
DSN: 335-2799/FAX:-2767

Army installations and activities within the District of Columbia;

Arlington and Fairfax Counties in Virginia; Montgomery and Prince George's counties in Maryland; Fort Ritchie, MD; Fort Holabird, MD; Fort Meade, MD; and Fort A.P. Hill, Fort Belvoir, and Vint Hill Farms, VA.

e. Commander, US Army, Pacific (USARPAC), ATTN: APIM-OEO

Fort Shafter, HI 96858-5410, Telephone: (808) 477-1054

DSN: 477-1054/FAX:-0691

Alaska and Hawaii

## Appendix C Program Plan for Interference Resolution

### C-1. Introduction.

a. Army operations must share spectrum resources with other users in both the Government and non-Government sectors, thereby increasing spectrum congestion and the potential for radio frequency interference both from and to Army spectrum-dependent materiel.

b. As portions of the spectrum are reallocated in the future, the potential for interference may increase. The Army and its officials could be found liable for interference with Civilian telecommunications in the vicinity of Army installations under the Federal Communications Act and implementing regulations. The possibility of interference must be monitored and prompt corrective action taken as needed.

c. Freedom from potential interference is a fundamental purpose of the Army E<sup>3</sup> Program. The structure of the Army acquisition program areas was designed for a logical succession of efforts to minimize the potential for Army spectrum-dependent materiel to either cause, or be susceptible to, radio frequency interference, beginning with standards and specifications, through equipment design and development, and finally with operational spectrum support after equipment is fielded.

### C-2. Purpose.

In recognition of the fact that interference will and does occur in operational environments, a program has been established to define policies and procedures for resolving interference when it occurs. This Appendix describes that program including technical considerations, organizational responsibilities, descriptions of technical assets, and interference resolution procedures which can help the Army overcome the effects of interference during Army operations.

### C-3. Types of Interference.

a. EMI. EMI is any electromagnetic or electrostatic disturbance that disrupts, interrupts, or otherwise degrades or limits the effective performance of spectrum-dependent materiel. Such interference can be caused by either intentional or unintentional sources.

b. Harmful Interference. Harmful interference is interference which endangers the functioning of a radionavigation service or other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service.

### C-4. Army Interference Resolution Authority.

The responsibility for interference reporting was assigned by the Deputy Chief of Staff, Operations (DCSOPS) to the Director of

Information Systems for Command, Control, Communications, Computers (DISC4) on 1 September 1992.1

### C-5. Scope.

These provisions of the AIRP apply to all active Army, ARNGUS, and USAR organizations.

### C-6. Program Relationships.

a. EMCP. Provisions for resolving interference affecting Army operations is an integral part of the EMCP. This relationship is exemplified in Figure C-1 in which various parts of the program function together to facilitate Army operations.

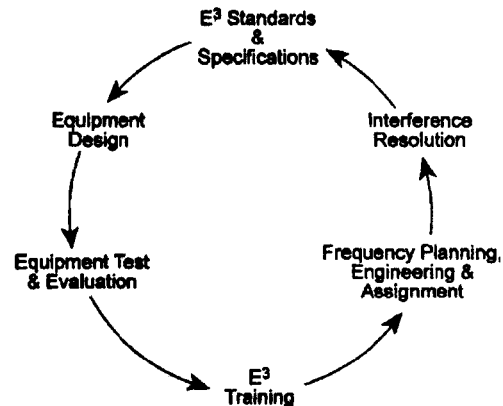


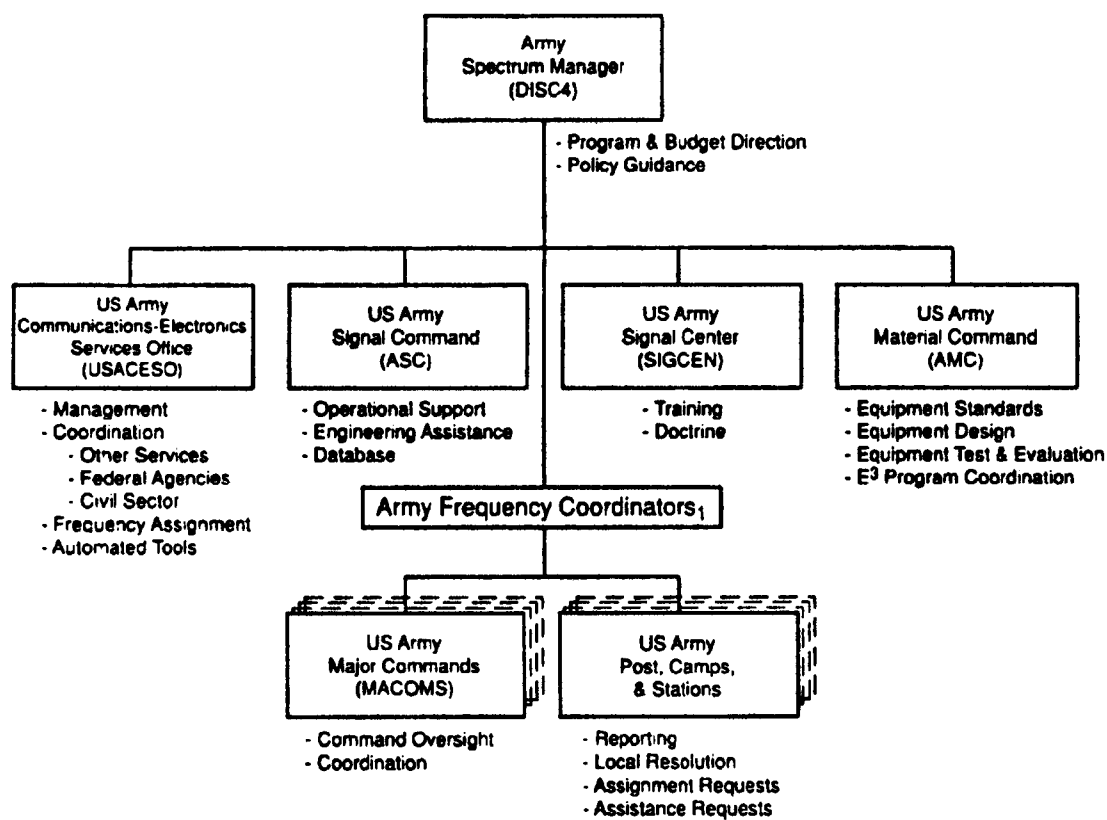
Figure C-1. Program relationships

b. E<sup>3</sup> Program. The principal relationship between interference and the E<sup>3</sup> program is information flow from the USACESO who provides interference reports to the E<sup>3</sup> program coordinator at the AMC and to the EPG. The coordinator analyzes these reports to identify the need for changes to E<sup>3</sup> standards and specifications to provide permanent solutions to recurring interference associated with technical characteristics of Army spectrum-dependent materiel or other materiel which affects the use of Army spectrum materiel for future procurements. The EPG adds the information to their equipment measurement database.

### C-7. Interference Resolution Functional Responsibilities.

Army organizations and activities with responsibilities regarding interference resolution are identified in Figure C-2. Specific responsibilities are:

a. Headquarters, Department of the Army (HQDA). HQDA, DISC4, Spectrum Management Office (SAIS-PAS-M) is responsible for providing policy and program guidance for the AIRP.



<sub>1</sub> Appropriate AFC. See Fig B-1 of Appendix B (Army Frequency Coordinators)

Figure C-2. Army interference resolution organization.

*b. Army Spectrum Manager.* The Army Spectrum Manager (SAIS-SM) directs the AIRP.

*c. US Army Communications-Electronics Services Office (USACESO).* USACESO, on behalf of the Army Spectrum Manager, will:

- (1) Provide day-to-day management of the AIRP worldwide.
- (2) Coordinate the AIRP with the JSC JSIR program and initiate Army requests for assistance.
- (3) Coordinate interference incidents involving space operations with US Space Command (USSPACECOM).
- (4) Serve as the Army focal point for interservice interference incidents and for incidents involving other Federal agencies or the civilian sector in the CONUS.
- (5) Assist the JSC in resolving Army interference incidents when JSIR assistance has been requested or is being provided.
- (6) Develop interference resolution training requirements and coordinate the requirements with the US Army TRADOC.
- (7) Establish interference resolution requirements for CONUS installations and validate Army interference resolution requirements from TRADOC and other MACOMS.
- (8) Manage, coordinate, and distribute automated interference resolution tools to meet the validated requirements.
- (9) Coordinate with AMC concerning the exchange of data and other information with the Army E<sup>3</sup> Program and Army E<sup>3</sup> database.

(10) Prepare, publish, and distribute a list of current Army interference resolution points-of-contact (POCs) to all Army installations.

(11) Program funds to support USACESO interference resolution responsibilities and activities.

*d. US Army Materiel Command (AMC).* AMC will:

- (1) Coordinate action within the materiel development and acquisition community regarding changes to E<sup>3</sup> standards and specifications or other corrective action.
- (2) Program and budget for AMC interference resolution responsibilities and activities.
- (3) Ensure that appropriate data from interference reports and other sources is provided to EPG for incorporation into the E<sup>3</sup> database.

*e. US Army Training and Doctrine Command (TRADOC).* TRADOC will:

- (1) Coordinate with USACESO regarding interference resolution training requirements for Army personnel.
- (2) Conduct interference resolution training of Army personnel through the TRADOC schools.
- (3) Program and budget for interference resolution responsibilities and Army-wide interference resolution training.

*f. US Army Signal Command (ASC).* ASC will:

- (1) Provide equipment and manpower for three (3) transportable DF and monitoring field teams.
- (2) Deploy the field team(s) within 24 to 72 hours after an initial

request for interference resolution assistance to detect, monitor, locate the source of, and assist in resolving interference situations.

(3) Document the results of interference resolution assistance in an after action report. Provide a copy of the documentation to USACESO.

(4) Maintain the automated historical database of Army interference reports.

(5) Program and budget for ASC interference responsibilities and activities.

g. *Commanders of Army Major Commands (MACOMs)*. Commanders of Army MACOMS will:

(1) Designate a MACOM Spectrum Manager as the POC for interference resolution.

(2) Coordinate interference resolution requests between the MACOM post, camp, and station DOIM, frequency managers, and ASC through the MACOM POC for interference resolution.

(3) Program and budget for interference resolution responsibilities and activities to include ASC assistance, JSIR assistance, and the acquisition of automated interference resolution hardware and software tools for use by the MACOM, DOIMs, and frequency managers.

(4) Provide guidance and direction to subordinate commands, installations, and activities.

h. *Army Post, Camp, and Station Director of Information Management (DOIM)*. The DOIM will:

(1) Serve as the installation POC for coordinating and assisting in resolving interference incidents involving the installation in accordance with this regulation and AR 5-3.

(2) Report all incidents of interference occurring on the installation that impact on Army operations, and submit copies of the interference report to USACESO and ASC.

(3) Assist and coordinate with tenant Army units, other military services, Government agencies, and civilian activities within 80 kilometers of the installation in resolving incidents of harmful interference.

(4) Maintain records of all authorized frequency assignments within the geographical area of the installation and maintain records of all interference incidents for the area of responsibility.

(5) Process requests for new military frequency assignments or modification of existing military assignments required to resolve interference situations, when necessary.

(6) Resolve incidents of interference with local assets and information whenever possible.

(7) Program and budget for procurement of hardware and software tools for use in the installation interference resolution activities.

i. *All Army Units and Activities*. Army units and activities will:

(1) Contact the installation DOIM or frequency manager immediately in all cases of actual or suspected interference.

(2) Provide the DOIM or frequency manager with essential information concerning incidents of interference (see Paragraphs C-11 and C-12).

(3) Operate all spectrum-dependent systems and equipment in strict accordance with radio frequency authorizations or frequency plans, particularly with respect to assigned frequency and emission/bandwidth, transmitter power limitations, and antenna height and direction.

(4) Attempt to locate and identify interference sources with organic resources including expedient antennas for DF when possible.

(5) Provide access to unit facilities, to installation personnel, or to other authorized technicians who are assisting in resolving the interference incident.

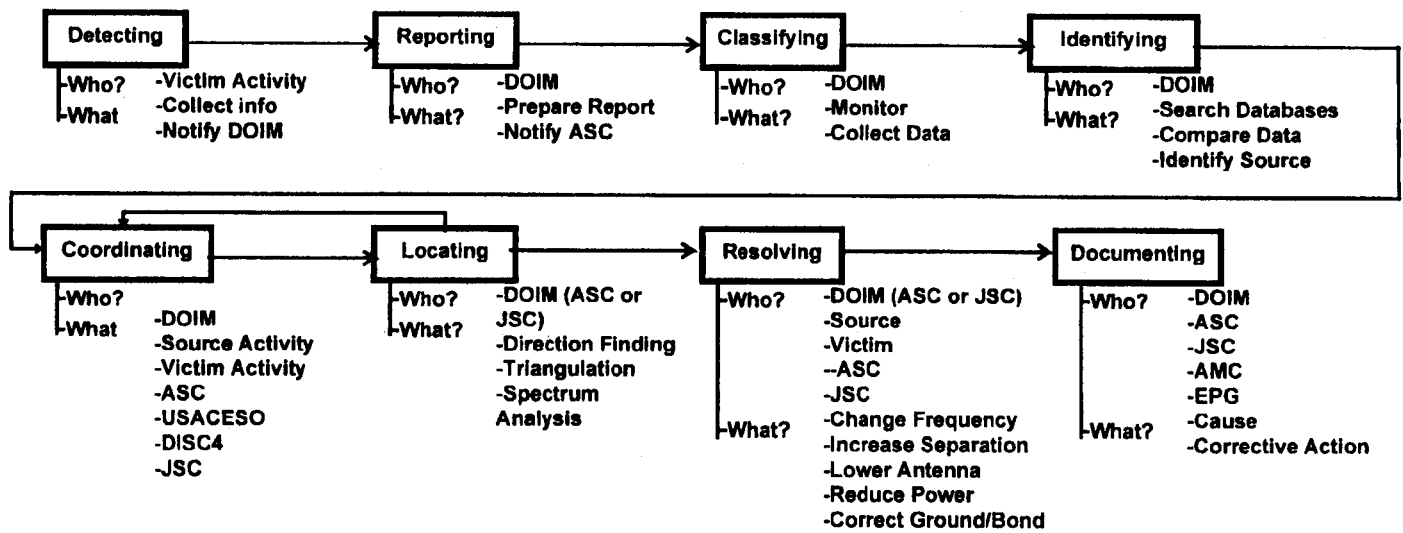
#### **C-8. General, Defining the Environments Where Harmful Interference Occurs, Resolution Assets, Reporting Procedures, and Coordination Procedures**

a. *General*. The DOIM or frequency manager at each Army installation is the “first line of offense” and is responsible for directing and coordinating all actions to resolve interference among Army units, tenant military activities, and civilian spectrum users (including host government users involved).

(1) Interference resolution during tactical exercises and operations is very similar to the manner in which interference is resolved while in garrison.

(2) High densities of spectrum-dependent equipment, used to support both offensive and defensive operations, are found in a relatively small radio LOS geographical area. HF reuse ratios are common on battlefields and during field training exercise. These situations create a potential for frequency interference to occur. The most significant difference is that the local interference resolution coordinating authority and POC is the Division Frequency Manager, and the regional coordinating authority is the Corps Frequency Manager. Depending on the tactical organization, the Army Component Frequency Manager plays a role in coordinating interference resolution activities when interference extends beyond a corps boundary or within the theater of operations.

(3) Interference resolution is viewed from the victim’s perspective. In almost all cases, resolving interference involves a set of activities that tend to be the same, regardless of the details of the interference incident. This is illustrated in Figure C-3. The impact of each interference incident is unique, and no standard procedure can be established that will guarantee resolution in every case. A reasoned, logical, step-by-step approach, however, will reduce time and cost in resolving interference situations.



**Term: DOIM = DOIM/frequency manager**

Figure C-3. General interference resolution model

(4) Resolving interference involves following a logical progression of induction and deduction. Figure C-4 is a logic diagram for instances when an Army activity is the victim in a sustaining base

environment. Figure C-5 is a logic diagram for instances when an Army unit is the victim in tactical operations or a training exercise environment.



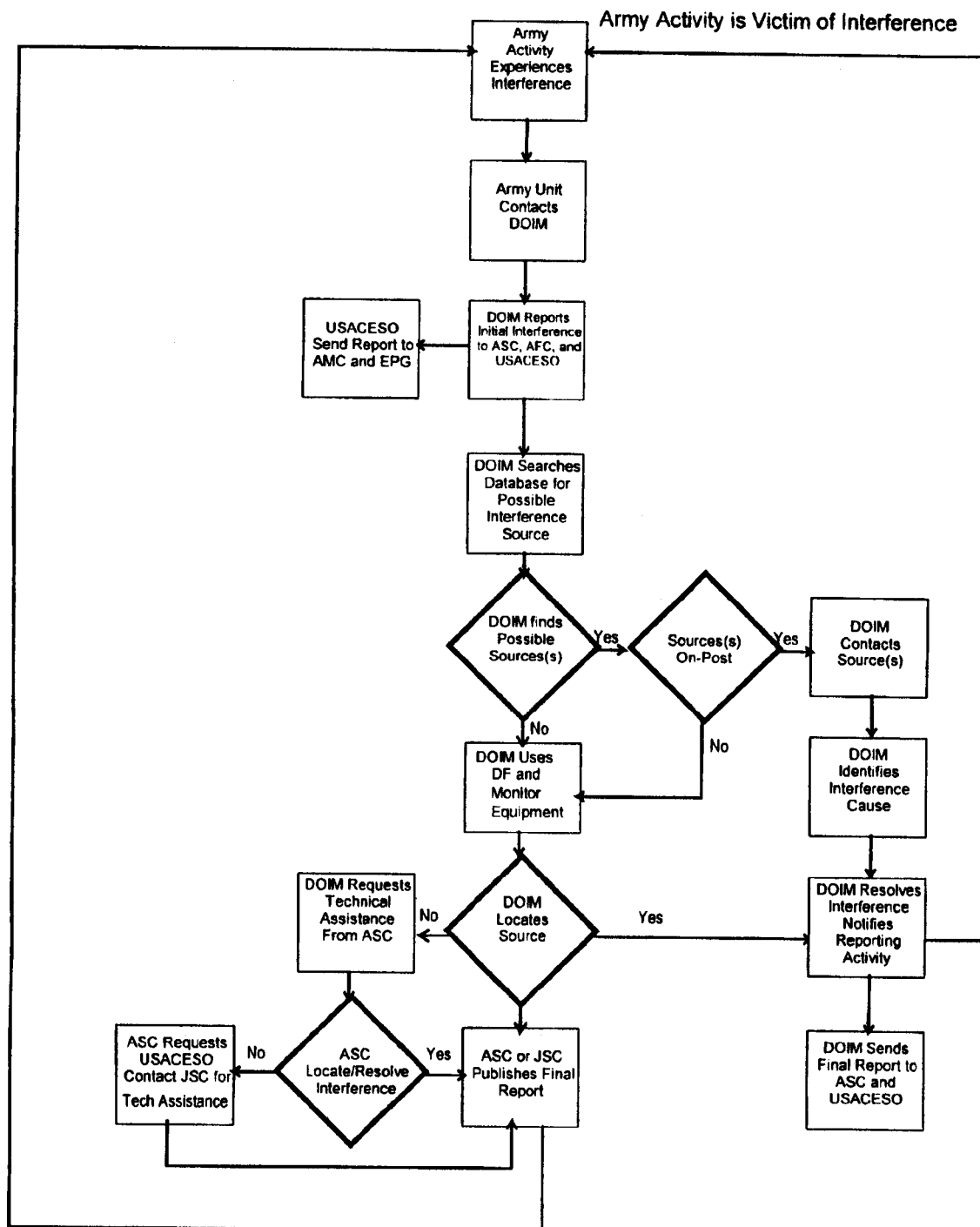


Figure C-4. Interference resolution (sustaining base environment (victim))

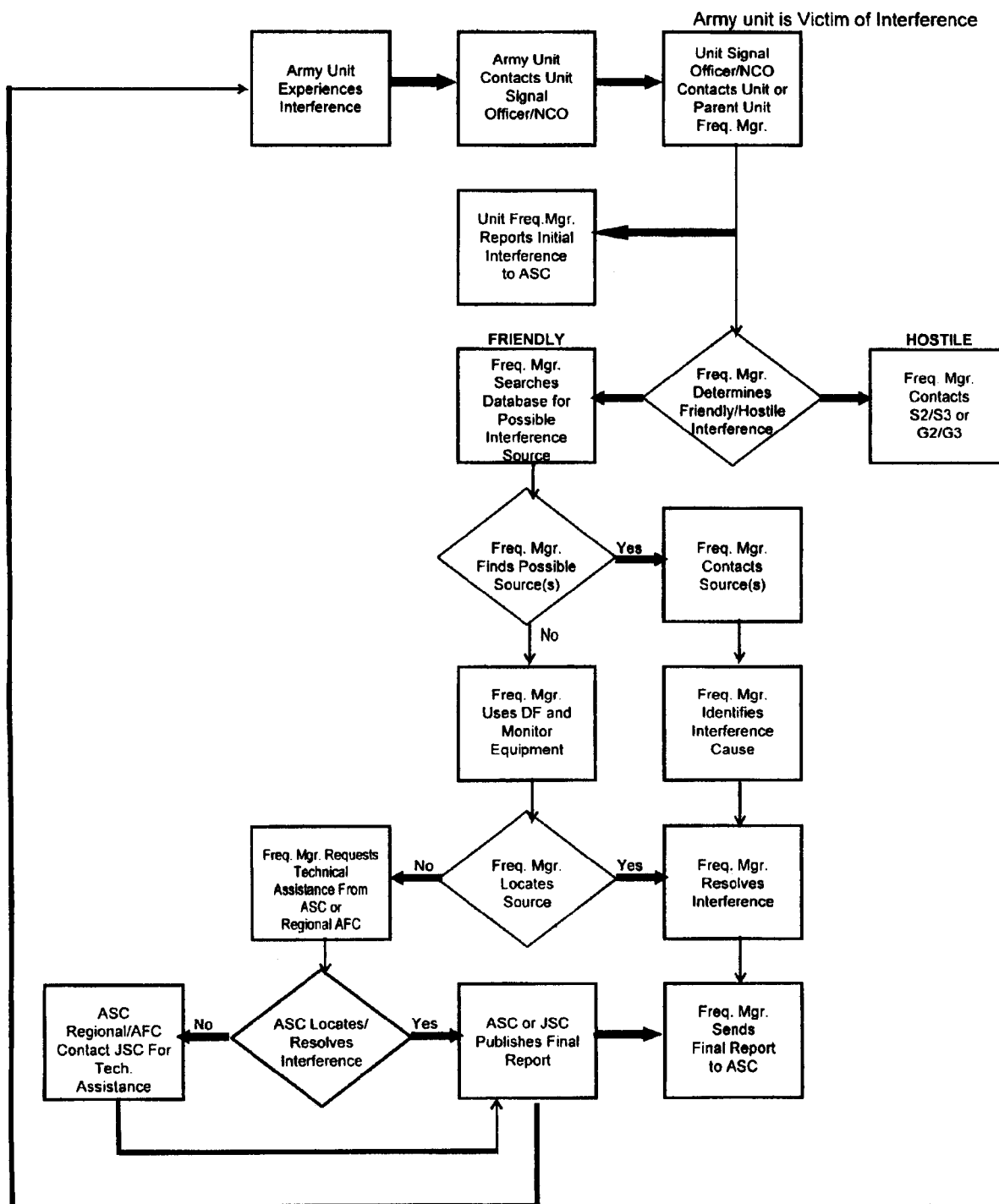


Figure C-5. Interference resolution (tactical operations/training exercise environment (victim)).

(5) Figure C-6 is a logic diagram that shows the activities for interference resolution when an Army activity is the source of interference in Sustaining Base and tactical operations/training environments.

(6) Sometimes the operator of spectrum-dependent equipment will find that differentiating between interference and other cases of disruption or unacceptable degradation is difficult. Operators should try, through the process of elimination, to determine if the disruption

or degradation is due to interference before notifying the DOIM or frequency manager of an interference situation.

(7) When harmful interference is known to be the cause of interference, the military activity responsible for operations will contact the installation DOIM or frequency manager immediately by the most expeditious means, usually by telephone. Army units and activities are responsible for using whatever organic resources are available, such as radio receivers or electronic test equipment to determine whether the cause of the disruption is interference in

order to gain as much information about the nature of the interference as possible. Army unit and activity personnel will be prepared,

during this initial contact with the DOIM or frequency manager, to provide as much information about the known or suspected interference as possible. As a minimum, the Army activity should furnish the essential information described in Paragraphs C-11 and C-12.

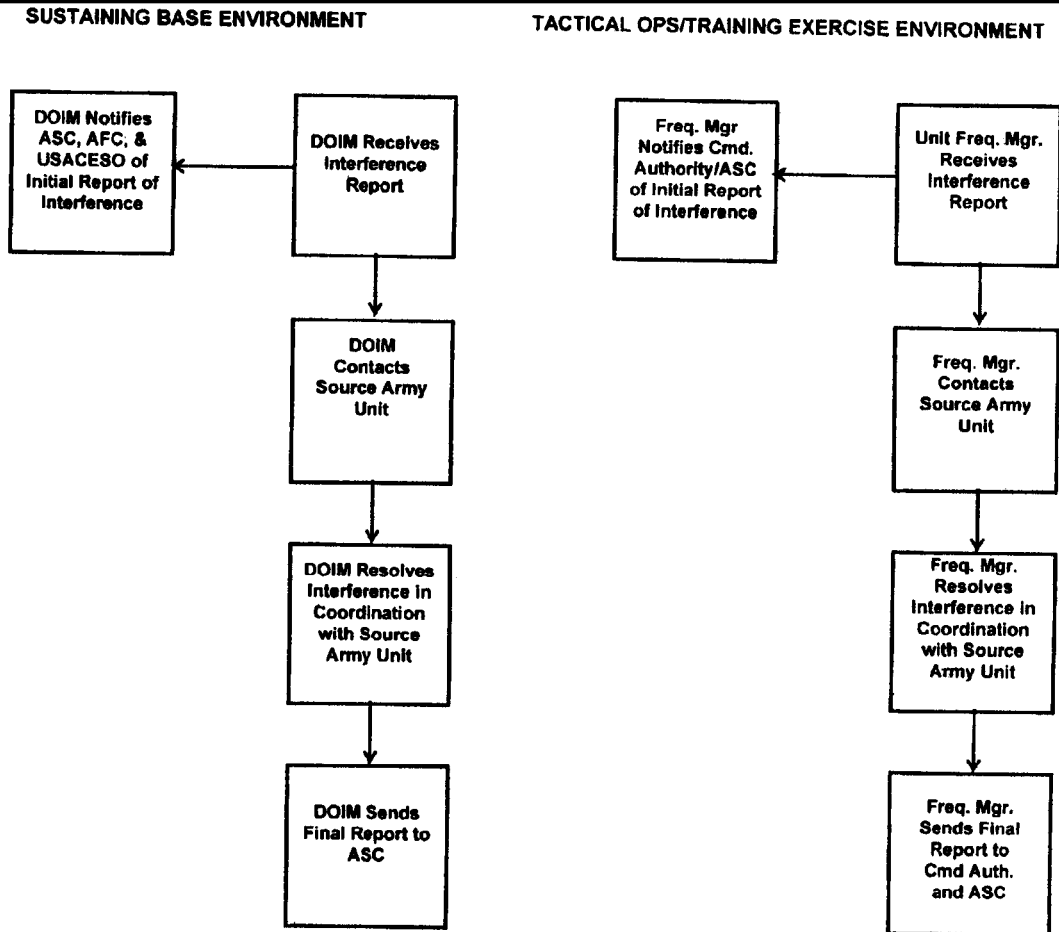


Figure C-6. Interference resolution (sustaining base and tactical operations/training environment (source)).

b. Defining the Environments Where Harmful Interference Occurs. For administrative and coordination purposes, environments where interference to Army operations occur have been subdivided into four categories: local, regional, national, and space. The subdivision designations are a function of the area of extent of Army operations involved in an interference situation. The definitions of the four environments are:

(1) Local interference. Local interference is defined as an interference situation within the boundaries of an Army post, camp, or station; or within 80 radio LOS kilometers from the edge of the installation boundary when Army operations are involved; or within a contiguous training area. The source and/or victim (military or civil) of the interference may be located either on or off the installation.

(2) Regional Interference. Regional interference is defined as an interference situation that involves multiple installations or locations within a command or geographical area.

(3) National Interference. National interference is defined as an interference situation affecting a wide area or an entire area of command responsibility that may include situations where the source of interference cannot be identified or located using local or regional assets.

(4) Space Interference. Space interference is defined as an interference situation involving military, other Government, civil, or commercial space operations.

c. Resolution Assets. There are several procedures and automated hardware and software tools available to aid in resolving interference at local, regional, national, or space environments. These resolution assets are:

(1) Records of previous local interference incidents maintained by the DOIM or unit frequency manager can be instrumental in resolving recurring interference. Such records can be searched and accessed rapidly if maintained in automated format.

(2) Frequency assignment records for the installation and the surrounding area from the frequency resource records (FRRS), government master file (GMF), and FCC files are an invaluable tool for ascertaining possible sources of interference, particularly when the interference is known or suspected to be fundamental-to-fundamental frequency interference. Subsets of these databases can be obtained from the regional AFCs or USACESO. Overseas Army activities involved in interference resolution can obtain frequency assignment information from the military FMOs, or from foreign host nation government and military spectrum management authorities.

(3) Equipment technical characteristics of spectrum-dependent materiel (e.g., the Army J-12 E3 database) are useful in resolving interference situations. In many instances, referring to equipment characteristics will lead to identifying the equipment causing the interference or suggest why the interference is disrupting performance of the victim equipment.

(4) Monitoring the interference while it is occurring provides

valuable information about the source of interference, e.g., type modulation (data, voice, pulse), antenna rotation rate, bandwidth, or other data about the source of interference.

(5) Hand-held DF equipment can be used to determine the location of interference sources. Army research, test, and evaluation facilities have sophisticated DF and monitoring equipment for use in accomplishing their assigned mission. Such activities include the White Sands Missile Range, NM; the Electronic Proving Ground, Fort Huachuca, AZ; the National Training Center, Ft Irwin, CA; the Joint Readiness Training Center, Ft Polk, LA; and the Combat Maneuver Training Center, Hohenfeld, GE. These facilities may be available for use in resolving interference situations on a case-by-case basis and should not be overlooked.

(6) In instances in which the source of the interference cannot be identified or located with locally available assets, technical assistance can be obtained from either ASC which maintains quick reaction field teams for field deployment or, through USACESO, from the JSC under the JSIR program.

(7) Other sources of technical assistance and information include commercial equipment manufacturers, developers of Army spectrum dependent materiel, or regional support activities of the FCC or FAA.

*d. Reporting Procedures.* It is the responsibility of all Army personnel to report incidents of interference. Reporting procedures are described below.

(1) Installation Procedures.

(a) Army units and other post, camp, and station tenant activities will notify, by the most expeditious means available, the supporting DOIM or frequency manager immediately when interference occurs. Personnel of affected activities will furnish the DOIM with as much information as possible about the interference during initial notification. Essential information required is defined in the interference reporting procedures described in Paragraphs C-11 and C-12.

(b) The DOIM supporting the affected Army activities will prepare and forward an initial interference report to ASC immediately in accordance with the format and procedures contained in Paragraphs C-11 and C-12. A copy of the initial report and subsequent interference reports will also be provided to the AFMO-CONUS, DoD AFC WSMR, DoD AFC Arizona, USACESO, and the MACOM DCSIM. The DOIM will prepare and forward a follow-up report when the interference has been resolved. The follow-up report will identify the causes of the interference and the corrective action taken.

(c) If safety of life is involved or potentially affected, the DOIM will report the interference incident immediately by the most expeditious means to the local command authority and the Office of the Army Spectrum Manager, Washington, DC.

(d) Incidents involving interference to Army operations in national and/or space environments must be reported and coordinated with ASC and USACESO. In cases of interference to space/satellite systems, USACESO must be contacted. USACESO will then coordinate with USSPACECOM to resolve the interference. Additional reporting and information collection requirements will be decided on a case-by-case basis by either ASC, USACESO, or the Army Spectrum Manager (SAIS-PAS-M).

(2) Tactical Operations/Training Exercise Procedure.

(a) In tactical operations or unit training exercises, unless it is specifically known that the interference is hostile, the interference incident should be reported to the unit signal officer.

(b) The signal officer will contact the unit or parent unit's frequency manager to assist in resolving the interference.

(c) If the frequency manager determines that the interference is hostile, the S2/S3 or G2/G3 representatives will be notified. The format for hostile interference reporting is found in the unit Standard Operating Procedure (SOP).

(d) If the frequency manager determines that assistance is required to resolve the interference, the frequency manager will contact the local DOIM or other regional POCs for assistance. An interference report is required. The format for reporting and a list of POCs is contained in Paragraphs C-11 and C-12.

(e) The frequency manager should refer to the exercise directive, service component, and/or CINC guidance, directive, or SOP on reporting interference. The frequency manager should also refer to the Air Land Sea Application (ALSA) Center Tactics, Techniques and Procedures (TTP) Pamphlet of Joint Spectrum Management (SM-J) to obtain reporting interference procedures when the unit is part of a Joint Task Force (JTF) organization.

(f) If safety of life is involved, or potentially affected, or if an interference incident could seriously affect international spectrum usage agreements, the frequency manager will report the interference incident immediately by the most expeditious means to the local command authority, the regional AFC, and the Office of the Army Spectrum Manager, Washington, DC.

(g) Incidents involving interference to Army operations in national and/or space environments must be reported and coordinated with ASC and USACESO. Additional reporting and information collection requirements will be decided on a case-by-case basis by either ASC, USACESO, the Army Spectrum Manager (SAIS-PAS-M), or the responsible Army Component Commander.

*e. Coordination Procedures.* It is important that the DOIM or the frequency managers coordinate with installation activities when incidence of interference is reported. Likewise, those Army activities whose operations are affected by harmful interference must take action to report and coordinate efforts to resolve the interference quickly. The coordination procedures are:

(1) Affected units must coordinate immediately by the most expeditious means with the supporting DOIM or frequency manager when an interference situation occurs.

(2) Commensurate with local command procedures, the DOIM or frequency manager supporting the local affected activity may coordinate directly with ASC for advice and assistance when in doubt regarding interference resolution procedures.

(3) When locally available interference resolution assets are not sufficient to resolve the interference, the DOIM or frequency manager supporting the affected activity will coordinate directly with ASC for assistance. Informal, initial coordination with ASC is acceptable; however, the DOIM or frequency manager will prepare and forward a formal request through normal command channels to ASC within 24 hours following the informal request.

(4) If the interference incident involves other Federal agencies, the civilian community, or if safety of life is imminent, the DOIM or frequency manager will coordinate immediately by the most expeditious means with local command authority, ASC, AFCS, USACESO, and the Office of the Army Spectrum Manager, Washington, DC.

(5) National and space interference incidents will be reported and coordinated with USACESO and ASC.

(6) International interference incidents will be reported and coordinated in accordance with host government agreements, or through the ITU structure or meetings.

## **C-9. Possible Sources and Causes of Interference.**

*a. Possible sources and causes of interference include:*

(1) Improper or inadequate frequency planning or engineering, e.g., lack of consideration of frequency intermodulation products in cosite environments.

(2) Not operating spectrum-dependent materiel in accordance with the RFA, e.g., antenna off azimuth, exceeding antenna height or transmit power limitations.

(3) Improper adjustment of tunable transmitters and receivers.

(4) Unknown and uncoordinated changes in equipment locations, e.g., installation of radio transmitters or repeaters in the civilian environment near Army activities.

(5) Operation of high power equipment such as radar in the vicinity.

(6) Lack of, or deterioration of, bonding and grounding provisions for spectrum-dependent materiel.

(7) Radiation from commercial industrial, scientific, and medical or other equipment not requiring licensing in the vicinity of telecommunications systems.

(8) Mixing two radio signals in a non-linear device external to

the transmitter and receiver and retransmitting intermodulation products of the two original signals. Although rarely identified, the so-called "rusty bolt problem" does occur.

(9) Operating two or more transmitters/receivers in close proximity (cosite) of each other.

(10) Using a frequency that is not assigned to the transmitter commonly referred to as "bootlegging."

(11) When a victim receiver is in the direct path of a transmitter and its intended receiver (overshot)

b. Different causes and sources of interference require different measures to locate and correct them. In some instances, resolution is as simple as changing frequencies (with proper authorization) or increasing the physical separation between the source of the interference and the victim. In other cases, monitoring and recording the interference with sophisticated DF equipment will be required to locate the source; spectrum analysis instrumentation may be needed to characterize the interference through measurement in order to identify possible interference sources.

c. Usually in simple situations, interference can be resolved locally; other times, technical assistance may be required from outside agencies. Permanent solution may require extensive coordination with various command, technical assistance, and operating activities. Changes in standards and specifications for equipment may be needed for future equipment development and acquisition, or modification to doctrine may be needed for using the spectrum-dependent materiel.

d. Procedures for identifying and resolving interference are discussed later. Fundamentally, reports of all interference incidents are required for analysis and permanent corrective actions. The information required in interference reports and the procedures for preparation and submission are contained in Paragraphs C-11 and C-12.

#### **C-10. Interference Resolution and Prevention—Factors and Capabilities.**

A number of factors and capabilities can be applied to resolving and preventing interference. The factors and capabilities are as follows:

a. *Frequency Assignments.* Properly planned and engineered frequency assignments are key to precluding interference. Possible frequency intermodulation products must be considered when choosing frequencies for cosited equipment. Assignments must observe frequency ranges allocated for specific telecommunications services. Transmitter power, polarity, radiation direction, and antenna height limitations must be observed to prevent transmitted energy from being transmitted beyond intended areas of reception.

b. *Training.* Training in equipment operations, spectrum discipline, and identifying and resolving interference is critical for effective telecommunications operations. Personnel at all levels must be familiar with provisions for reporting and eliminating interference. As more and more automated tools become available to assist the DOIMs and frequency management personnel, they must be trained in their operation and when and how to exploit these tools for rapid detection, location, and resolution of interference.

c. *Coordination.* In almost all instances of interference, coordinating resolution activities will involve personnel of operating units, supporting DOIMs, and frequency managers at posts, camps, and stations, command headquarters, and organizations providing administrative and technical assistance. Personnel must be familiar with the various schedules of activities occurring in the environment and coordination procedures and channels which have been established to resolve interference rapidly and effectively.

d. *Automated Tools.* Various automated tools, such as the Joint Spectrum Management System (JSMS), have been developed or are being developed to assist the DOIMs and frequency managers in resolving intency managers in identifying possible sources of interference. Formats, i.e., SFAF, have been created to expedite spectrum management matters. Electronic means such as Army E-Mail, bulletin board systems, and the Defense Data Network (DDN) also serve to expedite reporting activities. Personnel at all levels involved in interference resolution need to be aware of the existence of these tools and databases and become familiar with their use.

Automated tools in the hands of an experienced frequency manager will go a long way in resolving interference. The DOIMs and frequency managers can perform a valuable function by providing feedback to USACESO concerning ways that automated tools can be improved.

e. *Monitoring.* Monitoring the interfering signal can assist the DOIM and frequency manager in identifying the type of interference being encountered. In some cases, the radio receiver that is being victimized by interference can be used for monitoring; otherwise, more sophisticated spectrum analysis instruments will be required. Organizations equipped with more sophisticated equipment include ASC (operational EMC/EMI DF and monitoring support) and the JSC (JSIR support).

f. *DF.* Inexpensive off-the-shelf, hand-held DF equipment can be procured for use by DOIMs and frequency managers at Army posts, camps, and stations as an aid in determining the location of the source of interference. This equipment allows the DOIM or frequency manager to quickly locate radio transmissions in the vicinity of the post, camp, and station. More sophisticated DF equipment is available through ASC and, on a case-by-case basis, through the Army training centers, proving grounds, and test range facilities.

g. *Interference Reporting.* Historically, interference was reported only occasionally, if at all. Army personnel had little or no confidence in the ability of the "system" to resolve interference situations. Since the Army now has resumed responsibility for analyzing interference reports, this information has great potential value in categorizing interference and for providing input to a number of activities which are key to permanent solution of recurring interference situations. Included are changes to doctrine for Army telecommunications services and changes to EMC standards and specifications in conjunction with the Army E3 program.

#### **C-11. Interference Reporting Format and Procedures.**

Interference reports are a critically important part of the Army program for resolving interference. These reports, maintained by ASC and by each DOIM and frequency manager, serve several purposes.

a. The DOIM or frequency manager uses the file of interference reports as a data resource for identifying and resolving recurring interference incidents on the local installation.

b. The database of interference reports at ASC and the E3 database at EPG can be accessed to assist the DOIM or frequency manager in identifying a possible interference source(s). These reports can also be analyzed by USACESO to indicate interference trends and the need for recommending to the AMC that equipment design characteristics requirements be changed. USACESO can also recommend to the Army that Army doctrine for using spectrum-dependent materiel be changed. USACESO may utilize the interference reports to develop requirements for interference resolution training of Army personnel.

#### **C-12. Essential Information.**

a. *Initial Interference Reports.* Initial interference reports are required from the DOIM or frequency manager as soon as possible following notification of interference by an Army unit or by any other Federal agency or civil activity within 80 kilometers of the installation, or in accordance with existing host government agreements. As a minimum, interference reports should include the following information.

- (1) Classification and downgrading Instructions (as appropriate)
- (2) Date of report year-month-day (YYMMDD)
- (3) Originator Information:
  - (a) POC Title.
  - (b) POC Name (Last, First, MI).
  - (c) Organization.
  - (d) Office Symbol.
  - (e) Address (Street/building/suite).
  - (f) Address (City, State, Zip Code).
  - (g) Phone numbers (commercial and DSN).
- (4) Victim of Interference Information:
  - (a) POC Title.

- (b) POC Name (Last, First, MI).
- (c) Organization.
- (d) Phone number (commercial and DSN).
- (5) Interference Occurred:
  - (a) Date (YYMMDD).
  - (b) Time Period (Start and End).
  - (c) State/Country.
  - (d) Location.
  - (e) Coordinates (Latitude/Longitude).
- (6) Impact of Interference on the System.
- (7) Description of the System which was disrupted or degraded:
  - (a) Equipment nomenclature.
  - (b) Station Class (fixed (FX), land mobile (ML)).
  - (c) Emission designator.
  - (d) Receiving frequency.
- (8) Description of the Interference:
  - (a) Type (noise, voice).
  - (b) Repetition.
  - (c) Duration (days, hours, minutes).
- (9) Local actions taken to resolve the interference.
- (10) Assistance required (type).
- b. Follow-up Interference Reports.
  - (1) *Description of the system which caused the interference (if known).*
    - (a) Equipment Nomenclature.
    - (b) Frequency.
    - (c) Location/Call Sign.
  - (2) Technical Assistance Obtained:
    - (a) Date (YYMMDD).
    - (b) From Organization.
  - (3) Cause of the Interference.
  - (4) Action taken to resolve the interference.
  - (5) Recommendations for improving resolution techniques or for precluding any future interference.

## Appendix D Management Control Evaluation Checklist

### D-1. Function

The function covered by this checklist is to establish awareness for Radio Frequency Spectrum Allocation-to-Equipment Assessment. Information Mission Activities: Radio Frequency Spectrum Management.

### D-2. Purpose

The purpose of this checklist is to assist program/project/product managers, contracting officers, or commanders at all levels responsible for; coordination and integration of the research and development, test, acquisition, fielding, procurement, leasing, modification, installation, or operation of Army materiel requiring radio frequency spectrum support under AR 5-12. To apply appropriate and cost-effective frequency allocation-to-equipment measures. The controls listed provide reasonable assurance that Army resources are adequately safeguarded.

### D-3. Instructions

Answers must be based on the actual testing of key management controls such as document analysis, direct observation, interviewing, sampling, and simulation. Explain rationale for AYES@ responses or provide cross-reference to where rationale can be found. For ANO@ response, cross-reference to where corrective action plans can be found. For response of ANA,@ explain rationale. This checklist must be used 120 days after publication and every two years thereafter. Certification that this evaluation has been conducted must be accomplished on DA Form 11-2-R (Management Control Evaluation Certification Statement).

### D-4. Test Questions

a. Is the commander, program/project/product manager/contracting officer aware of the frequency allocation-to-equipment process?

Response YES/NO/NA

Remarks\*

*Note.* Cover off-the shelf, discretionary funding purchases.

b. Are the requirements for submission of DD Forms 1494 known?

Response YES/NO/NA

Remarks\*

c. Are records of DD Form 1494 and supporting documentation being maintained so information can be retrieved if necessary?

Response YES/NO/NA

Remarks\*

d. Has data been obtained from appropriate sources?

Response YES/NO/NA

Remarks\*

e. Is the supporting Army Frequency Coordinator (AFC) known?

Response YES/NO/NA

Remarks\*

f. Is the local installation/activity frequency manager known?

Response YES/NO/NA

Remarks\*

g. Have the appropriate operations, research and development, procurement and telecommunication personnel read and understood AR 5-12?

Response YES/NO/NA

Remarks\*

*Note.* . Cover off-the-shelf, discretionary funding purchases.

### D-5. Comments

Help make this a better tool for evaluating management controls. Submit comments to HQDA ATTN: SAIS-PAS-M (The Army Spectrum Manager) Army, Pentagon, WASH DC 20310.

## Appendix E Management Control Evaluation Checklist

### E-1. Function

The function covered by this checklist is to define responsibilities of commanders at all levels. Information Mission Activities: Radio Frequency Spectrum Management.

### E-2. Purpose

The purpose of this checklist is to assist program/project/product managers, contracting officers, or commanders at all levels responsible for; coordination and integration of the research and development, test, acquisition, fielding, procurement, leasing, modification, installation, or operation of Army materiel requiring radio frequency spectrum support under AR 5-12. To assign responsibilities and establish objectives and procedures in writing. To designate responsibilities and to develop implementing regulations, SOPs, or other guidance. The controls listed provide reasonable assurance that Army resources are adequately safeguarded.

### E-3. Instructions

Answers must be based on the actual testing of key management controls such as document analysis, direct observation, interviewing, sampling, and simulation. Explain rationale for AYES@ responses or provide cross-reference to where rationale can be found. For ANO@ response, cross-reference to where corrective action plans can be found. For response of ANA,@ explain rationale. This checklist must be used 120 days after publication and every two years thereafter. Certification that this evaluation has been conducted must be accomplished on DA Form 11-2-R (Management Control Evaluation Certification Statement).

#### E-4. Test Questions

a. Is all equipment, within the command, that radiates radio frequency (RF) energy essential to the mission?

Response YES/NO/NA

Remarks\*

b. Are RF transmitters operated without causing harmful interference to receivers (Government and non-Government) located on or near the installation or activity?

Response YES/NO/NA

Remarks\*

c. Are contractual obligations made for equipment that transmits or receives RF energy, before efforts are made to assure that it is frequency supportable?

Response YES/NO/NA

Remarks\*

*Note.* Cover off-the-shelf, discretionary funding purchases.

d. Is equipment procured or leased, off-the-shelf, acceptable for licensing by the Federal Communications Commission (FCC) when it operates only in the non-Government frequency bands?

Response YES/NO/NA

Remarks\*

*Note.* Cover off-the-shelf, discretionary funding purchases.

e. Are local frequency managers and supporting AFCs allowed to participate in all phases of information systems planning, including plans to modify equipment?

Response YES/NO/NA

Remarks\*

f. Are frequency allocation-to-equipment policies in AR 5-12 followed for transmitters and receivers of RF energy?

Response YES/NO/NA

Remarks\*

#### E-5. Test Questions for commanders of Army posts, camps, stations, installations, and activities

Response YES/NO/NA

Remarks\*

a. Are radio frequencies within the commander's area of responsibility authorized for use?

Response YES/NO/NA

Remarks\*

b. Have policies and procedures been established for efficient RF spectrum management within the commanders' area of responsibility?

Response YES/NO/NA

Remarks\*

c. Has an installation or activity frequency manager been appointed for management of radio frequency and nontactical call sign assignments?

Response YES/NO/NA

Remarks\*

d. Are records being kept of the use of radio frequencies and nontactical call signs?

Response YES/NO/NA

Remarks\*

e. Are procedures established to obtain frequency and call sign assignments from the supporting AFC?

Response YES/NO/NA

Remarks\*

f. Has a 5-Year Review Program been established and implemented per AR 5-12?

Response YES/NO/NA

Remarks\*

#### E-6. Comments.

Help make this a better tool for evaluating management controls.

Submit comments to HQDA ATTN: SAIS-PAS-M (The Army Spectrum Manager) Army, Pentagon, WASH DC 20310.

## Appendix F Management Control Evaluation Checklist

### F-1. Function

The function covered by this checklist is to determine Frequency Supportability for Equipment or System Research and Development (R&D). Information Mission Activities: Radio Frequency Spectrum Management.

### F-2. Purpose

The purpose of this checklist is to assist program/project/product managers, contracting officers, or commanders at all levels responsible for; coordination and integration of the research and development, test, acquisition, fielding, procurement, leasing, modification, installation, or operation of Army materiel requiring radio frequency spectrum support under AR 5-12. To plan for appropriate frequency supportability considerations early in the acquisition life cycle (e.g. during Concept Exploration Phase), and include in appropriate documentation. To insure frequency supportability requirements are included in all documentation used for the research and development (R&D) of all devices, equipment, and systems that will transmit and receive RF energy. The controls listed provide reasonable assurance that Army resources are adequately safeguarded.

### F-3. Instructions

Answers must be based on the actual testing of key management controls such as document analysis, direct observation, interviewing, sampling, and simulation. Explain rationale for AYES@ responses or provide cross-reference to where rationale can be found. For ANO@ response, cross-reference to where corrective action plans can be found. For response of ANA,@ explain rationale. This checklist must be used 120 days after publication and every two years thereafter. Certification that this evaluation has been conducted must be accomplished on DA Form 11-2-R (Management Control Evaluation Certification Statement).

### F-4. Test Questions

a. Has the operational capability of the proposed systems been identified?

Response YES/NO/NA

Remarks\*

b. Based on operational capability, have specific missions to be supported by the system, and functions of the subsystem, been identified?

Response YES/NO/NA

Remarks\*

c. Have telecommunications requirements needed to support the proposed mission been identified (e.g., data rates, circuit quality/reliability)?

Response YES/NO/NA

Remarks\*

d. Have alternate communications systems or subsystems not requiring frequency supportability been identified?

Response YES/NO/NA

Remarks\*

e. Have signal and/or software requirements been considered?

Response YES/NO/NA

Remarks\*

f. Have appropriate EMC considerations been given to the frequency tunability of the contemplated equipment/hardware?

Response YES/NO/NA

Remarks\*

g. Has consideration been given to intra-system implications on flexibility and EMC, and side effects on personnel and explosives?

Response YES/NO/NA

Remarks\*

*h.* Can off-the-shelf equipment be used?  
 Response YES/NO/NA  
 Remarks\*

*i.* If off-the-shelf equipment cannot be used, is new equipment necessary?  
 Response YES/NO/NA  
 Remarks\*

*j.* If new equipment is necessary, does this mean advancing the state-of-the-art to meet the telecommunications requirements?  
 Response YES/NO/NA  
 Remarks\*

*k.* Based only on technical factors, have idealized frequency bands or ranges been identified which could best support the telecommunications requirements?  
 Response YES/NO/NA  
 Remarks\*

*l.* Do existing allocations provide for the services required by the system in the idealized frequency bands?  
 Response YES/NO/NA  
 Remarks\*

*m.* If allocation support does not exist in the idealized bands, are there any appropriately allocated bands that could satisfy the telecommunications requirements?  
 Response YES/NO/NA  
 Remarks\*

*n.* Have penalties (in terms of time, cost, and performance) been associated with the available frequency allocation alternatives?  
 Response YES/NO/NA  
 Remarks\*

*o.* Have areas or locations been identified in which the proposed system is to be deployed?  
 Response YES/NO/NA  
 Remarks\*

*p.* Has adequate consideration been given to the electromagnetic environment including: idealized versus available frequencies; and tradeoffs of time, cost, and performance?  
 Response YES/NO/NA  
 Remarks\*

*q.* Has a final study been published which supports rationale for band selection?  
 Response YES/NO/NA  
 Remarks\*

*r.* Are there any system limitations that may be imposed by electromagnetic environment factors?  
 Response YES/NO/NA  
 Remarks\*

## F-5. Comments

Help make this a better tool for evaluating management controls. Submit comments to HQDA ATTN: SAIS-PAS-M (The Army Spectrum Manager) Army, Pentagon, WASH DC 20310.

## Appendix G Management Control Evaluation Checklist

### G-1. Function

The function covered by this checklist is to determine frequency supportability modifications in the experimental phase (Frequency Supportability for Equipment or System Research and Development (R&D)). Information Mission Activities: Radio Frequency Spectrum Management.

### G-2. Purpose

The purpose of this checklist is to assist Program/project/product managers, contracting officers, or commanders at all levels responsible for; coordination and integration of the research and development, test, acquisition, fielding, procurement, leasing, modification, installation, or operation of Army materiel requiring radio frequency

spectrum support under AR 5-12. To plan for experimentation criteria upon which to validate or modify frequency supportability considerations originally identified in the planning phase. To insure frequency supportability requirements are included in all documentation used in experimentation with all devices, equipment, and systems that will transmit or receive RF energy. The controls listed provide reasonable assurance that Army resources are adequately safeguarded.

### G-3. Instructions

Answers must be based on the actual testing of key management controls such as document analysis, direct observation, interviewing, sampling, and simulation. Explain rationale for AYES@ responses or provide cross-reference to where rationale can be found. For ANO@ response, cross-reference to where corrective action plans can be found. For response of ANA,@ explain rationale. This checklist must be used 120 days after publication and every two years thereafter. Certification that this evaluation has been conducted must be accomplished on DA Form 11-2-R (Management Control Evaluation Certification Statement).

### G-4. Test Questions

*a.* Have frequency supportability changes been identified from previously submitted planning data?  
 Response YES/NO/NA  
 Remarks\*

*b.* Have aspects of systems, along with telecommunications characteristics, requiring experimentation been identified?  
 Response YES/NO/NA  
 Remarks\*

*c.* Have specified, alternative telecommunications requirements been identified in detail?  
 Response YES/NO/NA  
 Remarks\*

*d.* Have signal and/or software philosophy techniques been considered?  
 Response YES/NO/NA  
 Remarks\*

*e.* Has consideration been given to EMC potential of alternative telecommunications designs been investigated?  
 Response YES/NO/NA  
 Remarks\*

*f.* Has appropriate EMC consideration been given to the frequency tunability of the proposed equipment/hardware?  
 Response YES/NO/NA  
 Remarks\*

*g.* Has adequate consideration been given to intra-system implications on flexibility and EMC, and the side effects on personnel and explosives?  
 Response YES/NO/NA  
 Remarks\*

*h.* Have all factors been identified that affect spectrum requirements and EMC?  
 Response YES/NO/NA  
 Remarks\*

*i.* Have pertinent economic trade-offs with respect to spectrum use been identified?  
 Response YES/NO/NA  
 Remarks\*

*j.* Are spectrum considerations included in any request for procurement (RFP) preparation?  
 Response YES/NO/NA  
 Remarks\*

*k.* In updating the frequency band selection alternatives in this phase, were the most satisfactory frequency bands identified?  
 Response YES/NO/NA  
 Remarks\*



*l.* Are there other studies available about the frequency selection process to prepare for filing for frequency support of the system?

Response YES/NO/NA

Remarks\*

### G-5. Comments

Help make this a better tool for evaluating management controls. Submit comments to HQDA ATTN: SAIS-PAS-M (The Army Spectrum Manager) Army, Pentagon, WASH DC 20310.

## Appendix H Management Control Evaluation Checklist

### H-1. Function

The function covered by this checklist is to determine frequency supportability modifications in the developmental stage (Frequency Supportability for Equipment or System Research and Development (R&D)). Information Mission Activities: Radio Frequency Spectrum Management.

### H-2. Purpose

The purpose of this checklist is to assist Program/project/product managers, contracting officers, or commanders at all levels responsible for; coordination and integration of the research and development, test, acquisition, fielding, procurement, leasing, modification, installation, or operation of Army materiel requiring radio frequency spectrum support under AR 5-12. To plan for development criteria upon which to validate or modify frequency supportability considerations originally identified in previous stages. To insure frequency supportability requirements are included in all documentation used in all testing and developmental documentation. The controls listed provide reasonable assurance that Army resources are adequately safeguarded.

### H-3. Instructions

Answers must be based on the actual testing of key management controls such as document analysis, direct observation, interviewing, sampling, and simulation. Explain rationale for AYES@ responses or provide cross-reference to where rationale can be found. For ANO@ response, cross-reference to where corrective action plans can be found. For response of ANA,@ explain rationale. This checklist must be used 120 days after publication and every two years thereafter. Certification that this evaluation has been conducted must be accomplished on DA Form 11-2-R (Management Control Evaluation Certification Statement).

### H-4. Test Questions

*a.* Have frequency supportability changes been identified from previously submitted data?

Response YES/NO/NA

Remarks\*

*b.* Have aspects of systems or subsystems been identified which require development?

Response YES/NO/NA

Remarks\*

*c.* Have proper adjustments been made to overall system configuration based on experimental stage?

Response YES/NO/NA

Remarks\*

*d.* Have the following been considered: instrumentation, spurious emissions, electromagnetic coupling, emission spectrum, antennas, receiver, and signal processing requirements and/or limits?

Response YES/NO/NA

Remarks\*

*e.* Do EMC specifications comply with prevailing standards and criteria?

Response YES/NO/NA

Remarks\*

*f.* Can difference from prevailing standards and criteria for EMC be justified?

Response YES/NO/NA

Remarks\*

*g.* Have areas of current design been identified in which system performance is degraded due to EM environment, and will EMI problems be created in other systems?

Response YES/NO/NA

Remarks\*

*h.* Based on prior planning experience, has basis for modification of EMC/EMI standards been identified?

Response YES/NO/NA

Remarks\*

*i.* Have plans for special tests, measurement techniques, and simulation efforts been defined which will aid in validating design?

Response YES/NO/NA

Remarks\*

*j.* Did Development Phase review of frequency band selection change from previous stage review?

Response YES/NO/NA

Remarks\*

*k.* If frequency band selection was changed in Development Stage review, was change technologically justified?

Response YES/NO/NA

Remarks\*

*l.* Were specific frequency requirements identified for development systems-integration testing?

Response YES/NO/NA

Remarks\*

### H-5. Comments

Help make this a better tool for evaluating management controls. Submit comments to HQDA ATTN: SAIS-PAS-M (The Army Spectrum Manager) Army, Pentagon, WASH DC 20310.

## Appendix I Management Control Evaluation Checklist

### I-1. Function

The function covered by this checklist is to validate frequency supportability prior to procurement of equipment, systems, or facilities which are spectrum-dependent. (Frequency Supportability for Equipment or System Research and Development (R&D)). Information Mission Activities: Radio Frequency Spectrum Management.

### I-2. Purpose

The purpose of this checklist is to assist Program/project/product managers, contracting officers, or commanders at all levels responsible for; coordination and integration of the research and development, test, acquisition, fielding, procurement, leasing, modification, installation, or operation of Army materiel requiring radio frequency spectrum support under AR 5-12. To validate frequency supportability before procurement of devices, equipment, systems, or facilities, and include all appropriate documentation. To insure frequency supportability requirements are included in all documentation for procurement of all devices, equipment, systems, and facilities that will transmit or receive RF energy. The controls listed provide reasonable assurance that Army resources are adequately safeguarded.

### I-3. Instructions

Answers must be based on the actual testing of key management controls such as document analysis, direct observation, interviewing, sampling, and simulation. Explain rationale for AYES@ responses or provide cross-reference to where rationale can be found. For ANO@ response, cross-reference to where corrective action plans can be found. For response of ANA,@ explain rationale. This checklist must be used 120 days after publication and every two

years thereafter. Certification that this evaluation has been conducted must be accomplished on DA Form 11-2-R (Management Control Evaluation Certification Statement).

#### I-4. Test Questions

*a.* Have changes in all previous stages been identified and submitted for consideration?

Response YES/NO/NA

Remarks\*

*b.* Have basic technical characteristics been clearly defined, i.e. transmitted power, emission characteristics (bandwidth, modulation, data rate), antenna orientation and directivity, receiver characteristics (sensitivity, selectivity, etc.)?

Response YES/NO/NA

Remarks\*

*c.* Have all special technical characteristics peculiar to the proposed system and having potential EMC problems been adequately identified and described (i.e. complex modulation schemes, filters, special receiver circuitry, signal processing, etc.)?

Response YES/NO/NA

Remarks\*

*d.* Has all data developed during previous phases of the system's life cycle been considered and evaluated in completing the telecommunications requirements and/or characteristics?

Response YES/NO/NA

Remarks\*

*e.* Have previous EMC analyses been reviewed and updated?

Response YES/NO/NA

Remarks\*

*f.* Are additional studies required to assess changes to system design, deployment, and other factors?

Response YES/NO/NA

Remarks\*

*g.* Have equipment tests been specified to identify and validate performance aspects and susceptibility features of the total system to EMI identified in previous and updated analyses?

Response YES/NO/NA

Remarks\*

*h.* Have both static and dynamic electromagnetic environments for testing been considered?

Response YES/NO/NA

Remarks\*

*i.* Have in-field EMC assessment techniques (frequency assignment aids, equipment usage aids, grading for performance, measurement programs, EMC maintenance procedures) been considered to support procurement and deployment planning for the system?

Response YES/NO/NA

Remarks\*

*j.* Has a discrete frequency plan been proposed?

Response YES/NO/NA

Remarks\*

*k.* Has the number of frequencies required, within a specified band or bands, been identified?

Response YES/NO/NA

Remarks\*

*l.* Have channeling limitations, transmit/receive separation, and other pertinent limitations and system peculiarities been identified?

Response YES/NO/NA

Remarks\*

*m.* Has all deployment information (mobile, transportable, and/or fixed) for the system(s) been developed?

Response YES/NO/NA

Remarks\*

*n.* Have locations been identified for testing and operation?

Response YES/NO/NA

Remarks\*

*o.* Have operational altitudes and orbital locations and characteristics been identified for airborne and satellite systems?

Response YES/NO/NA

Remarks\*

*p.* Have EMC procedures and techniques been identified to educate users on deployment of the system(s)?

Response YES/NO/NA

Remarks\*

#### I-5. Comments

Help make this a better tool for evaluating management controls. Submit comments to HQDA ATTN: SAIS-PAS-M (The Army Spectrum Manager) Army, Pentagon, WASH DC 20310.

## Glossary

### Section I Abbreviations

#### AAE

Army Acquisition Executive

#### ABCA

Australia, Britain, Canada, and America

#### ACCS

Army Command and Control System

#### ACP

Allied Communications Publication

#### ACSIM

Assistant Chief of Staff for Information Management

#### AEPG

Army Electronic Proving Ground

#### AFC

Army Frequency Coordinator

#### AFMO

Army Frequency Management Office

#### AIMS

Army IFF Mark XII Systems

#### AIRP

Army Interference Resolution Program

#### ALSA

Air Land Sea Application

#### AM

Amplitude Modulation

#### AMC

Army Materiel Command

#### APPBS

Army Planning, Programming, and Budgeting System

#### AR

Army Regulation

#### ARC

Army Reserve Command

#### ARFA

Allied Radio Frequency Agency

#### ARNG

Army National Guard

#### ARSTAF

Army Staff

#### ASA

Assistant Secretary of the Army

#### ASM2P

Army Spectrum Management Master Plan

#### ATC

Air Traffic Control

#### AWIS

Army WWMCCS Information System

#### AZ

Arizona

#### BEEO

Battlefield Electromagnetic Environments Office

#### BR

Radiocommunication Bureau (French translation)

#### BSMO

Battlefield Spectrum Management Office or Officer

#### C3CM

Command, Control, and Communications Countermeasures

#### C-E

Communications-Electronics

#### CB

Citizen Band

#### CCEB

Combined Communications-Electronics Board

#### CECOM

Communications-Electronics Command

#### CEOI

Communications-Electronics Operation Instructions

#### CG

Commanding General

#### CINC

Commander-in-Chief (Unified Command)

#### CINCEUR

Commander-in-Chief, Europe

#### CINCPAC

Commander-in-Chief, Pacific Command

#### CINCOSU

Commander-in-Chief, Southern Command

#### COEA

Cost and Operational Effectiveness Analysis

#### CONUS

Continental United States

#### CONUSA

Continental United States Army

#### COTS

Commercial off-the-shelf

#### CTC

Combat Training Center

#### CWG

Consultative Working Group

#### DA

Department of the Army

#### DACC

The Department of the Army Command and Control System

#### DCS

Defense Communications System

#### DCSIM

Deputy Chief of Staff for Information Management

#### DCSOPS

Deputy Chief of Staff, Operations

#### DDN

Data Defense Network

#### DECON

Deconfliction

#### DET

Detachment

#### DF

Direction Finding

#### DIRLAUTH

Direct Liaison Authorized

#### DISC4

Director of Information Systems for Command, Control, Communications and Computers

#### DoD

Department of Defense

#### DoDD

Department of Defense Directive

#### DOIM

Director of Information Management

#### DSC

Digital Selective Calling

#### DSCS

Defense Satellite Communications System

#### DSN

Defense Switched Network

#### DT

Development Test

#### E<sup>3</sup>

Electromagnetic Environmental Effects

#### EA

Electronic Attack

#### ECAC

Electromagnetic Compatibility Analysis Center (Now the Joint Spectrum Center)

**ELINT**  
Electronics Intelligence

**EMC**  
Electromagnetic Compatibility

**EMCP**  
Electromagnetic Compatibility Program

**EME**  
Electromagnetic Environment

**EMETF**  
Electromagnetic Environmental Test Facility

**EMI**  
Electromagnetic Interference

**EMP**  
Electromagnetic Pulse

**EMRH**  
Electromagnetic Radiation Hazard

**EMV**  
Electromagnetic Vulnerability

**EP**  
Electronic Protect

**EPG**  
Electronic Proving Ground

**ES**  
Electronic Support

**EW**  
Electronic Warfare

**FAA**  
Federal Aviation Administration

**FAS**  
Frequency Assignment Subcommittee

**FCC**  
Federal Communications Commission

**FM**  
Field Manual

**FMG**  
Frequency Management Group

**FMO**  
Frequency Management Office

**FORSCOM**  
Forces Command

**FP**  
Frequency Panel

**FRRS**  
Frequency Resource Record System

**FY**  
Fiscal Year

**GHZ**  
Gigahertz

**GMF**  
Government Master File

**HF**  
High-Frequency

**HQDA**  
Headquarters, Department of the Army

**Hz**  
Hertz

**IEEE**  
Institute of Electrical and Electronics Engineers

**IEW**  
Intelligence and Electronic Warfare

**IFF**  
Identification, Friend or Foe

**IFRB**  
International Frequency Registration Board

**IM**  
Information Mission

**ING**  
International Notification Group

**INSCOM**  
Intelligence and Security Command

**IPR**  
In-Process Review

**IRAC**  
Interdepartment Radio Advisory Committee  
or Internal Review Audit Compliance

**IRM**  
Information Resource Management

**ISC**  
Information Systems Command

**ISEC**  
Information Systems Engineering Command

**ISM**  
Industrial, Scientific, and Medical

**ITU**  
International Telecommunication Union

**JCS**  
Joint Chiefs of Staff

**JETDS**  
Joint Electronics Type Designation System

**JFMO**  
Joint Frequency Management Office

**JFP**  
Joint Frequency Panel

**JRTC**  
Joint Readiness Training Center

**JSC**  
Joint Spectrum Center

**JSIR**  
Joint Spectrum Interference Resolution

**JSMS**  
Joint Spectrum Management System

**JTF**  
Joint Task Force

**kHz**  
Kilohertz

**LCSMM**  
Life Cycle System Management Model

**LMR**  
Land Mobile Radio

**LOS**  
Line-of-Sight

**LOT**  
Letter of Transmittal

**MACOM**  
Major Army Command

**MARS**  
Military Affiliate Radio Station

**MCS**  
Maneuver Control System

**MDW**  
Military District of Washington

**MED**  
Medical

**MEDEVAC**  
Medical Evacuation

**MHZ**  
Megahertz

**MM**  
Maritime Mobile

**MRB**  
Materiel Review Board

**MSC**  
Major Subordinate Command

**MSCC**  
Major Subordinate Component Command

**MSE**  
Mobile Subscriber Equipment

**MUSARC**  
Major United States Army Reserve  
Command

**NASA**  
National Aeronautics and Space  
Administration

<b>NATO</b> North Atlantic Treaty Organization	<b>RACES</b> Radio Amateur Civil Emergency Services	<b>SOP</b> Standard Operating Procedure
<b>NAVAIDS</b> Navigational Aids	<b>RADHAZ</b> Radiation Hazard	<b>SPS</b> Spectrum Planning Subcommittee
<b>NCA</b> National Command Authority	<b>RBECS</b> Revised Battlefield Electronics CEOI System	<b>SRA</b> Ship Radio Authorization
<b>NGB</b> National Guard Bureau	<b>RC</b> Reserve Component	<b>SSDC</b> Space and Strategic Defense Command
<b>NSA</b> National Security Agency	<b>RCC</b> Range Commanders' Council	<b>STANAG</b> Standardization Agreement
<b>NTC</b> National Training Center	<b>RFA</b> Radio Frequency Authorization	<b>STANFINS</b> Standard Financial System
<b>NTIA</b> National Telecommunications and Information Administration	<b>RD&amp;A</b> Research, Development and Acquisition	<b>STD</b> Simulated Tactical Deployment
<b>OCONUS</b> Outside Continental United States	<b>RF</b> Radio Frequency	<b>STN</b> Station
<b>ODP</b> Operational Development Plan	<b>RFL</b> Restricted Frequency List	<b>TAG</b> The Adjutant General
<b>OPTEC</b> Operational Test and Evaluation Command	<b>RR</b> Radio Regulation	<b>TAMMIS</b> Theater Army Medical Management Information System
<b>OSA</b> Office of the Secretary of the Army	<b>RTCA</b> Radio Technical Commission for Aeronautics	<b>TB</b> Technical Bulletin
<b>OT</b> Operational Test	<b>RTCM</b> Radio Technical Commission for Marines	<b>TDA</b> Table of Distribution and Allowance
<b>PAC</b> Pacific	<b>SATCOM</b> Satellite Communications	<b>TECOM</b> Test and Evaluation Command
<b>PAM</b> Pamphlet	<b>SFAF</b> Standard Frequency Action Format	<b>TELEX ID</b> Teleprinter Identifier
<b>PE</b> Propagation Engineering	<b>SG</b> Study Group	<b>TIWG</b> Test Integration Working Group
<b>PEO</b> Program Executive Office	<b>SIDPERS</b> Standard Installation/Division Personnel System	<b>TOE</b> Table of Organization and Equipment
<b>PM</b> Program or Project Manager	<b>SIGINT</b> Signal Intelligence	<b>TPFDD</b> Time Phased Force Deployment Data
<b>PPBES</b> Planning, Programming, Budgeting, and Execution System	<b>SM-J</b> Joint Spectrum Management	<b>TRADOC</b> Training and Doctrine Command
<b>PPI</b> Planned Product Improvement	<b>SMO</b> Spectrum Management Office	<b>TTP</b> Tactics, Techniques, and Procedures
<b>PUB</b> Publication	<b>SMR</b> Specialized Mobile Radio	<b>US&amp;P</b> United States and Possessions
<b>PVI</b> Positive Voice Identification	<b>SO</b> Signal Officer	<b>USA</b> United States Army
<b>QRC</b> Quick Reaction Capability	<b>SOC</b> Special Operations Command	<b>USACE</b> United States Army Corps of Engineers
<b>QSTAG</b> Quadripartite Standardization Agreement	<b>SOI</b> Signal Operation Instruction	<b>USACESO</b> United States Army Communications-Electronics Services Office

**USAKA**

US Army Kwajalein Atoll

**USAMEDCOM**

US Army Medical Command

**USAR**

United States Army Reserve

**USARC**

US Army Reserve Command

**USAREUR**

United States Army, Europe

**USARJ**

United States Army Japan

**USARPAC**

United States Army Pacific

**USASSDC**

US Army Space and Strategic Defense Command

**USMCEB**

United States Military Communications-Electronics Board

**USNG**

United States National Guard

**USSPACECOM**

United States Space Command

**WRC**

World Radio Conference

**WSMR**

White Sands Missile Range

**WWMCCS**

Worldwide Military Command and Control System

**YPG**

Yuma Proving Ground

## Section II Terms

**Allocation**

An allocation is the designation of frequency bands for use in performing specific functions or services. Allocations are made to communications services such as fixed, mobile, broadcast, and amateur.

**Allotment.**

An allotment is the designation of specific frequency bands or frequencies within a prescribed allocation. Within the Federal Government, allotments are made to specific Government agencies.

**Army Frequency Coordinator.**

The AFC serves as the focal point for radio frequency and call sign requests within the US&P which required registration and clearance at the national level. The AFC coordinates with counterparts of other Military Services and Government agencies prior to

making frequency and call sign assignments. M2P).

**Army Spectrum Management Master Plan (ASM2P)**

A document that issues spectrum management policies, plans, and programs. It includes directives and programs to accomplish such plans and policies. The ASM2P also provides the management baseline data to periodically review the effectiveness of spectrum management programs.

**Assignment.**

An assignment is the designation of a specific frequency or frequencies for use by a radio station under specified conditions.

**Deconfliction.**

An integral part of spectrum management, deconfliction is a process of optimizing the usage of the spectrum incorporating both the requirements of the battlefield spectrum managers and the EW operations.

**Department of Defense Area Frequency Coordinator.**

An office empowered by the USMCEB to provide overall management and use of the spectrum in areas on or near a National Test Range or other designated complex.nation and resolution of harmful radio frequency interference caused by or to DoD users. Terms of reference for the DoD AFCs is contained in ACP 190 US SUPP-1, Annex B.

**Electromagnetic Compatibility.**

The capability of electrical and electronic systems, equipment, and devices to operate in their intended electromagnetic environment within a defined margin of safety, and at design levels of performance without suffering or causing unacceptable degradation as a result of electromagnetic interference.

**Electromagnetic Environment.**

All electromagnetic radiation, manmade and natural, emanating from emitters at the lowest alternating current to the highest RF in the environment are included.

**Electromagnetic Environmental Effects.**

The impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines, including EMC/EMI; EMV; electromagnetic pulse; electronic warfare; hazards of electromagnetic radiation to personnel, ordnance, and volatile materials; and natural phenomena effects of lightning and p-static.

**Electromagnetic Interference.**

Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment. It can be induced intentionally, as in some forms of EW warfare, or unintentionally, as a result of spurious

emissions and responses, intermodulation products, or the like.

**Electromagnetic Pulse.**

The electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium. The resulting electric and magnetic fields may be coupled with electrical/electronic systems to produce damaging current and voltage surges. The electromagnetic pulse may also be caused by non-nuclear means.

**Electromagnetic Spectrum.**

The range of frequencies of electromagnetic radiation from zero to infinity. It is divided into 26 alphabetically designated bands.

**Electromagnetic Radiation.**

Radiation made up of oscillating electric and magnetic fields and propagated with the speed of light. This radiation includes gamma radiation; x-rays; ultraviolet, visible, and infrared radiation; and radar and radio waves.

**Electromagnetic Radiation Hazards.**

Those electromagnetic radiations which are a source of direct danger to the human body or those that could possibly detonate or ignite explosives, flammable gases or vapors, dust, or easily ignitable particles or fibers.

**Electronic Protect (EP).**

The division of EW involving actions taken to ensure friendly, effective use of the electromagnetic spectrum despite the enemy's use of EW.

**Electromagnetic Vulnerability.**

The characteristics of a system which cause it to suffer a definite degradation (incapability to perform the designated mission) after being subjected to a certain level of effects in an unnatural (manmade), hostile environment. Electromagnetic vulnerability measures the system's incapacity to perform in the presence of hostile EA. Electromagnetic vulnerability is measured only in its own operational environment (actual or simulated) and under conditions which take into account:

- a. How susceptible the system is.
- b. How easily it can be intercepted by hostile intercept and direction-finding activities.
- c. The nature and extent of the hostile EW threat.

**Electronic Attack (EA).**

Actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum.

*Note.* This definition was extracted from FM 34-40-7.

**Electronic Attack Clearance.**

An approval or authorization to conduct EA (e.g., jamming, chaff drops) in a given geographical area under specified conditions and controls to prevent harmful interference to

other authorized spectrum users. The provisions of AR 105-86 apply in CONUS. OCONUS, appropriate Unified directives apply. A frequency assignment does not provide authority to conduct EA.

#### **Electronic warfare.**

Military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum, and action which retains friendly use of the electromagnetic spectrum. There are three divisions of electronic warfare: EA, EP, and ES measures.

#### **EMC analysis.**

An objective investigation into the potential frequency spectrum resource requirements of Army frequency spectrum-dependent systems or equipment. Recommended to be conducted prior to entering the phases of the LCSMM as a cost-saving measure and to determine if proposed system or equipment is frequency supportable in its proposed environment. EMC analysis will present the trade-offs regarding use of the electromagnetic spectrum in various technical concepts for fulfilling Army materiel requirements.

#### **Frequency Allocation-to-Equipment Process.**

The process is a spectrum requirement and is used to determine that Army spectrum-dependent equipment operates in frequency bands according to national and international frequency allocation tables and conforms to all other applicable spectrum management regulations, directives, standards, and specifications. The process is started as early as possible in the research, development, production, and procurement cycle. This early start is to efficiently assure future spectrum assignments and EMC. (See Chapter 4 for more details).

#### **Information Resources Management (IRM).**

The planning, budgeting, organizing, directing, training, promoting, controlling, and management activities associated with the burden, collection, creation, maintenance, utilization, dissemination, and disposition of information regardless of media. IRM includes the management of information and information related resources and systems, whether manual or automated, such as records management activities, privacy and security of records, agency sharing and dissemination of information, and acquisition and use of automatic data processing, telecommunications, and other information technology.

#### **Interference.**

See electromagnetic interference.

#### **Occupied Bandwidth.**

The bandwidth within which 99 percent of the total emitted energy is contained. The occupied bandwidth must encompass the necessary bandwidth. If not, the transmitter will

not emit a signal wide enough to successfully convey all the information.

#### **Radio Wave Propagation.**

The transfer of energy by electromagnetic radiation at radio frequencies.

#### **Spectrum-Dependent Equipment.**

Army telecommunications and command and control systems (including weapon systems), subsystems, or equipment which either depend on or affect the use of the electromagnetic spectrum. Further defined by DoD Regulation 5000.2-R as, "systems and equipment that emit or receive Hertzian waves."

#### **Spectrum Management.**

The management of the use of electromagnetic spectrum resources. The goal of Army spectrum management is to support telecommunications, weapons systems, and electronic warfare requirements. This goal will be accomplished through the acquisition of spectrum resources, the efficient use of those resources, and the attainment of electromagnetic compatibility.

#### **Spectrum Management Doctrine.**

Fundamental principles which guide Army use of the electromagnetic spectrum for operation of Army telecommunications and command and control systems (including weapons systems), subsystems, and equipment. These principles are official and require sound military and technical judgment in application. Principles may be based on:

- a. Basic physical phenomena associated with radio wave propagation and radiation.
- b. National or international regulatory constraints on the use of the frequency spectrum.
- c. The need for coordination and cooperation among users of the frequency spectrum.
- d. EW implications.

#### **Spectrum Plan.**

An organized and documented scheme which identifies the specific spectrum resources required for a military operation (such as a contingency operation or field training exercise) or to operate a telecommunications system (such as a satellite communications system). Spectrum plans will be engineered to ensure communicability and to reduce interference, both among the frequencies in the plan and between the frequencies in the plan and those in use or planned in the coexistent electromagnetic environment.

#### **Spectrum Resources.**

Allocations, allotments, or assignments of portions of the electromagnetic spectrum for the accomplishment of a specific function or telecommunications service. In an operational environment, spectrum resources are the specific number and types of frequency assignments needed to operate items of spectrum-dependent materiel.

#### **Spectrum Support.**

The potential availability of operating frequencies (frequency assignments) to meet specific type-of-service and operational requirements.

#### **Telecommunications.**

Any transmission, emission, or reception of signs, signals, writing, images, and sound or information of any nature by wire, radio, or other electromagnetic or optical systems.

#### **Telecommunications Service.**

A specific function performed by a system, subsystem, or equipment such as fixed, mobile, broadcasting, or mobile satellite.

#### **Waiver.**

A written authorization to accept a system, subsystem, or equipment which, having been submitted for inspection, does not meet specified requirements but is considered suitable for use 'as is' or after rework by an approved method.

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# MANAGEMENT CONTROL EVALUATION CERTIFICATION STATEMENT

1. REGULATION NUMBER

2. DATE OF REGULATION

For use of this form, see AR 11-2; the proponent agency is ASA(FM).

3. ASSESSABLE UNIT

4. FUNCTION

5. METHOD OF EVALUATION *(Check one)*

a. CHECKLIST

b. ALTERNATIVE METHOD *(Indicate method)*

APPENDIX *(Enter appropriate letter)*

6. EVALUATION CONDUCTED BY

a. NAME *(Last, First, MI)*

b. DATE OF EVALUATION

7. REMARKS *(Continue on reverse or use additional sheets of plain paper)*

8. CERTIFICATION

I certify that the key management controls in this function have been evaluated in accordance with provisions of AR 11-2, Management Control . I also certify that corrective action has been initiated to resolve any deficiencies detected. These deficiencies and corrective actions *(if any)* are described above or in attached documentation. This certification statement and any supporting documentation will be retained on file subject to audit/inspection until superseded by a subsequent management control evaluation.

a. ASSESSABLE UNIT MANAGER

(1) TYPED NAME AND TITLE

b. DATE CERTIFIED

(2) SIGNATURE



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